MDGP 44-133

Laboratory Pamphlet

Keesler Medical Center

Keesler AFB MS

DEPARTMENT OF THE AIR FORCE
81ST MEDICAL GROUP (AETC)
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Medical

LABORATORY PAMPHLET

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This pamphlet implements Air Force Policy Directive (AFPD) 44-1, *Medical Operations*, and provides general laboratory policies and procedures guidance, along with specific information and requirements for lab testing in Blood Bank, Serology, Chemistry, Hematology, Microbiology, Surgical Pathology, Autopsy Pathology, Tumor Registry, Cytology, and Genetics. Ensure all records created as a result of processes prescribed in this publication are maintained in accordance with Air Force Manual (AFMAN) 37-123 (will convert to AFMAN 33-363), *Management of Records,* and disposed of in accordance with the Air Force Records Disposition Schedule (RDS) located at https://afrims.amc.af.mil/. See Attachment 1 for a glossary of references and supporting information. This pamphlet applies to all 81st Medical Group (81 MDG) personnel.

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SUMMARY OF CHANGES

Updated Quick Reference Phone List to include new 376/591 prefix. Tables listed/named incorporated. Added information concerning "read-back" of critical results. Updated ward round collection times to coincide with current practice. Updated and revised the critical value notification procedures. Chemistry, Hematology, and Hemostatis reference ranges updated to current values. Updated Microbiology critical/reportable values listing and specimen collection/comments chart. Changed Section J, Cytology, to reflect current services available. A star (★) indicates changes from last revision.

Section A—Introduction

1. Vision Statement:

1.1. Tomorrow's Technology Today

2. Mission Statement:

2.1. Training, Wellness, and Readiness for Global Response

3. Organization:

3.1. Anatomic Pathology: Includes histopathology, cytopathology, autopsy pathology, and tumor registry.

3.2. Clinical Laboratory: Includes Laboratory Operations (specimen collection, processing, and shipping), Transfusion Services (Blood Donor Center, Therapeutic Apheresis), Clinical Chemistry (special and general), Hematology, Coagulation, Urinalysis, Microbiology, (special microbiology, mycology, mycobacteriology, parasitology), Serology, and Laboratory Systems (management of information systems).

3.3. Referral Specialty Center: Provides anatomic pathology and clinical laboratory specialty services and consultation for medical treatment facilities throughout the Department of Defense.

3.4. Medical Readiness: Provides robust capability in deployable and fixed facility response for Expeditionary Medical Support (EMEDS), Biological Augmentation Team (BAT) Unit Type Code, Homeland Defense Laboratory Response Team and Centers for Disease Control and Prevention Laboratory Response Network for Bioterrorism.

4. Laboratory Accreditation:

4.1. The College of American Pathologists (CAP) accredits the Pathology/Clinical Laboratory Flight. The Transfusion Service and Blood Donor Center are also accredited by the American Association of Blood Banks and licensed by the Food and Drug Administration. The Tumor Registry is accredited by the American College of Surgeons. The American Society of Cytopathology accredits cytology.

5. Point of Care Testing:

5.1. Laboratory tests performed by departments outside the laboratory must follow Clinical Laboratory Improvement Act of 1988 (CLIA 88) guidelines including as applicable, test methodology, controls, and procedure documentation. Personnel in each department performing the test complete required procedures. Per Medical Group Instruction (MDGI) 44-175, *Quality Management for Lab Testing in Ancillary (Point of Care) Locations* sections desiring to establish Point of Care (POC) testing laboratories must request approval, prior to test implementation, through the Clinical Laboratory (SGOL).

6. Computerized Laboratory Information System:

6.1. The Laboratory Information System (LIS) is one component of Composite Health Care System/The Electronic Charting System Department of Defense (DoD) electronic health records systems (CHCS/AHLTA). The LIS module provides order processing, specimen processing, and results management.

6.2. CoPath is a separate information management system that interfaces with CHCS/AHLTA and provides for ordering, processing and result management for anatomical pathology. Only anatomic pathology personnel have access to CoPath. Anatomic pathology results appear in CHCS/AHLTA after completion and verification in CoPath.

6.3. The Defense Blood Standard System (DBSS) is the Department of Defense computer system for blood services utilized in the management of the blood donor services and transfusion services activities. DBSS documents all facets of these services providing a permanent record of all activities.

6.4. LIS and CHCS/AHLTA support for a particular patient is triggered by an order entered into the system. The system is designed for provider order entry, but will also support order entry by other authorized users.

6.5. Only certified results are released to users outside the laboratory. Certified results maintained within CHCS/AHLTA become available to any authorized user who inquires at any CHCS/AHLTA terminal.

6.6. The LIS system tracks a number of statuses: "unacknowledged," means no specimen is accessioned; "pending," indicates specimen has been received and testing is in progress; and "completed," means a certified report is available.

6.7. CHCS/AHLTA allows for automatic printing of completed/amended results directly to a specified printer for a specified hospital location. The options are: print all results, print STAT (Needed Urgently) results, and/or print no results. The laboratory sets this option to print no results until the clinic requests another option. Managers of clinics can call 376-4427 and speak with Laboratory Systems personnel to change their printer option.

6.8. CHCS/AHLTA can print all certified results at any requesting location (e.g., Intensive Care Unit (ICU) or Emergency Department), or automatically according to MTF specified locations. Certified results for specimens referred to outside laboratories are individually returned to the referring location on referral result slips for each specimen analyzed.

6.9. If there are problems with CHCS/AHLTA Laboratory functions call the Lab Systems office, at 376-4427.

7. Laboratory Locations:

7.1. The Medical Center Laboratory and anatomic pathology offices are in Section E, of Building 0468, on the 1st Floor. Approved POC testing labs are located in various departments and wards throughout the Medical Center.

8. Laboratory Hours:

8.1. General: The laboratory is fully staffed Monday-Friday from 0700-1700. Evening, night, and holiday shifts are minimally staffed. A pathologist is on call at all times.

8.2. The phlebotomy area is open Monday-Friday 0700-1730, and CLOSED Saturdays, Sundays, and holidays. Please contact the Reception Desk, 376-4460 for Saturday, Sunday, and holiday hours.

8.3. Laboratory access after normal duty hours is available for hospital personnel through the door located off the north hall of the laboratory. Patients should report to the main laboratory entrance and telephone laboratory personnel for assistance.

9. Specimen Collection:

9.1. Inpatient Identification Verification:

9.1.1. The College of American Patholigists' Standards states that hospital personnel must confirm the patient’s identity by checking at least two identifiers before collecting a specimen. But the patient’s room number can not be used as an identifier.

9.1.2. First Identification Method: The first step in patient identification is to ask the patient to state his/her name, and compare the information with the patient's wristband, and the test requisition form/labels. Never ask "Are you Mr./Mrs. X?" An ill patient may answer "yes" erroneously. Always ask the patient to state their name to you.

9.1.3. There is an exception if the patient is unconscious or cannot speak. The standards state that another caregiver (i.e., ward nurse), or family member should be asked to provide the information that would otherwise be asked of the patient. Compare the answered information with the patient's wristband, and the test requisition form/labels. Document the name of the verifier in the test requisition form or label. Unidentified emergency patients should be given some temporary but clear designation until positive identification can be made.

9.1.4. Second Identification Method: All inpatients should have a wristband with their identification information on it. **DO NOT** draw any in-patient without a wristband. Report patients without proper Identification (ID) wristband to the ward nurse. When verifying the patient's armband, check the following areas against the requisition form/labels: Patient's name, Patient's Social Security Number (SSAN) or hospital number.

9.2. Outpatient Identification Verification: All patients coming to the reception desk are required to show their military identification card. The military identification will be used to ensure that the proper patient is accessioned in the computer system.

9.2.1. The phlebotomist will check the picture ID against the collection labels and ask the patient to state their name and their (or their sponsor's) Social Security Number (SSN) to verify the patient's identity.

9.2.2. If the patient is a child, ask the parent to verify the name and SSN.

9.2.3. Any patient with no form of identification or who cannot verify their SSN will be referred to the Noncommissioned Officer In Charge (NCOIC) of Laboratory Systems. Laboratory technicians collect blood specimens by standard venipuncture or capillary puncture techniques. Collections by other techniques are performed by laboratory technicians only under direct physician supervision and after prior approval of the Flight Medical Director. Lab phlebotomists are allowed to attempt blood collection from the antecubital region of patient arms. Phlebotomists will not collect blood from patients with "ports" used for blood collection. In addition, phlebotomists will attempt to collect blood below the Intravenous (IV) site for patients with IVs if unable to locate another appropriate phlebotomy site. If unable to locate a site below the IV site, the phlebotomist will follow the steps outlined in section 9.3.

9.3. Standard venipuncture must take place on the opposite limb from any kind of active intraveneous line. If no site is available (**Example:** Patient has an IV in the back of both hands), the IV must be turned off a minimum of 2 minutes prior to the venipuncture. This status must be reported in the final results. The lab tech should let the ward nurse know that they need to draw blood on Mr. X and that the nurse needs to stop the IV fluids. After at least 2 minutes, the lab staff will go back in and draw the blood. If the nurse is busy and there is a delay, the lab tech may need to leave the draw with the nurse.

9.3.1. If nursing personnel intend to collect a blood specimen from an indwelling line or catheter, the line must be flushed prior to the draw and the first ten (10) mL blood specimen must be discarded prior to filling sample tubes.

9.4. Order of Draw: The following order-of-draw, which is recommended when drawing several specimens during a single venipuncture, is based on pragmatism. Its purpose is to avoid possible test result error due to cross contamination from tube additives. This procedure should be followed for both evacuated tubes, and syringe transfer of blood to multiple tubes.

9.4.1. Blood culture tube

9.4.2. Plain tube, non-additive (e.g., red stopper)

9.4.2. Coagulation tube (e.g., blue stopper)

9.4.4. Additive tubes:

9.4.4.1. Gel separator tube

9.4.4.1.1. Heparin (e.g., green stopper)

9.4.4.1.2. Ethylenediaminetetra-Acetic Acid (EDTA) (e.g., lavender stopper)

9.4.4.1.3. Oxalate/fluoride (e.g., gray stopper)

9.5. Specimen labels must include correct patient's full name, full social security number, date and time of specimen collection and initials of the person collecting the specimen. **Specimens collected by Non-Lab personnel should be labeled using a printed bar-coded label generated from CHCS/AHLTA that contains the above information being sure to add the collecting personnel's initials and the time of collection to the label."**

9.6. Laboratory Management has carefully considered the need for reducing laboratory test sample volumes. Large blood draw volumes should be avoided by carefully considering the need for laboratory tests, avoiding unnecessary repetition of test, and minimizing use of standing orders. The CHCS/AHLTA System minimizes tubes collected by bundling multiple tests under a single accession number. Tests from a single workstation are bundled under a single accession reducing the number of tubes required. Please contact the laboratory section of interest to obtain specific minimum specimen volumes required for testing.

9.7. All specimens must be submitted in biohazard bags or other suitable containers to ensure blood borne pathogen exposure protection. Specimens must be hand-carried to the laboratory or sent through the medical group pneumatic tube system. Specimens hand-carried must be given to a laboratory technician before the submitting technician leaves the laboratory. Refer to MDGI 44-180, *Pneumatic Tube System*, for guidance regarding tube system specimen transport requirements and tube system operations.

★ 9.8. Ward rounds:

9.8.1. Ward rounds are conducted at 0530. Test requests must arrive in the laboratory not later than 30 minutes preceding the desired collection time to allow time for preparing specimen labels and collection lists. Tests ordered after cutoff times **ARE NOT** accepted and collection becomes the responsibility of the provider/nursing staff. The majority of inpatient requests should be scheduled for morning collection since phlebotomists are busy with outpatient phlebotomy during normal duty hours. During the evening and midnight shifts, the laboratory is minimally staffed and excessive ward round collections during these shifts prolong all test result reporting times. After arriving on the wards, laboratory phlebotomists are not allowed to accept "add on" requests for patients not scheduled for collection.

9.8.2. Ward rounds are not performed by the laboratory staff on certain wards including: ICU, Coronary Care Unit (CCU), Cardiothoracic Vascular (CTV), and Neonatal Intensive Care Unit (NICU). Specimens are collected by unit personnel or the medical provider.

9.8.3. Specimens collected during ward rounds are assigned a routine analytical priority and cannot be drawn or processed as STATs. In addition, blood cultures are not collected during scheduled ward rounds. Blood culture collection is the responsibility of the nursing/professional staff.

9.8.4. Ward personnel must ensure patient availability during scheduled lab phlebotomy. If patient is unavailable, requests are turned over to the nursing unit staff for subsequent collection.

9.8.5. Lab phlebotomists are allowed two attempts to collect blood. If the phlebotomist is unable to collect the specimen, the ward round team leader is notified. The team leader or a second experienced phlebotomist may make two additional blood collection attempts. On rounds where only one technician is assigned only two attempts are made before returning requests to the nursing station. If neither laboratorian is able to obtain the sample, requests are returned to the nursing station for collection by ward personnel.

9.8.6. Lab personnel should cancel orders for ward round specimens that were not collected by lab personnel, ward personnel, or professional staff during ward rounds. If the specimen is to be subsequently collected by ward personnel, then ward personnel should generate a new order and print new labels reflecting actual collection time.

10. Criteria for or Specimen Rejection:

10.1. General specimen **rejection criteria** are based on improper specimen labeling, collection, handling, or submission.

10.1.1. Some general rejection criteria are specimens that are contaminated on the outside of the collection container, improper collection container, specimen containers that leak, or specimens received in the pneumatic tube system that are not in biohazard bags. Specific criteria and requirements for individual tests are found throughout this manual.

10.2. All specimens must be properly labeled (see section 9.5.). All labels are placed on the content vessel and **NOT** on their lids or caps.

10.3. Blood samples for "TYPE & SCREEN" or "CROSSMATCH" absolutely must have the collector's initials and the time/date of collection on the specimen container, additionally, the data must match the signed Standard Form (SF) Form 518, *Medical Record-Blood or Blood Component Transfusion (DD Form 2005, Privacy Act Statement-Health Care Records serves).*

10.4. If rejection compromises patient care (one-time specimens, such as Cerebral Spinal Fluid (CSF), cultures, etc. or STAT requests), lab personnel will contact a pathologist, lab officer or technical supervisor to determine if the specimen will be tested. In some instances, ward personnel or provider is contacted to correct deficiencies before specimens are accepted for laboratory processing.

11. Laboratory Test Orders:

11.1. All orders by in-house providers will be entered into CHCS/AHLTA. Orders by civilian doctors will be placed on laboratory slips or prescriptions. Orders must contain doctor’s full name, the tests desired, and patient identification information including patient’s full name and a fax number where the results may be sent.

11.2. All requests are considered routine unless indicated otherwise. Oral requests will be accepted only in unusual or extremely urgent situations and must be followed by written or electronic authorization as soon as possible (within 24 hours).

11.3. Preoperative Test Requests: Specimens for preoperative workups must be in the laboratory No Later Than (NLT) 1400 the day before scheduled surgery. Pre-op specimens, for transfusion services for Monday surgery must be collected on the preceding Friday, Saturday, or Sunday. If Monday is a holiday, pre-op transfusion specimens for Tuesday must be collected by 1400 on Monday and are not collected the preceding Friday.

11.4. Receiving specimens without orders in CHCS/AHLTA. Occasionally, unusual circumstances arise that require sending a specimen prior to ordering the tests in CHCS/AHLTA. When this occurs, the lab will use the following protocol to process the specimen. Laboratory receiving personnel will call the sending unit and ask the patient's physician or nurse to enter the orders into CHCS/AHLTA. If the orders are not in CHCS/AHLTA in 30 minutes the lab will call again for a final reminder. To ensure that your requests are processed as soon as possible we encourage you to call 376-4460 to let the receiving technician know when the orders are in CHCS/AHLTA. If no orders are entered into CHCS/AHLTA by the end of the shift or after 4 hours (whichever is longer), the specimen will be placed into a "hold rack" for 24 hours and then discarded.

12. Emergency Procedures:

12.1. Testing Categories: The laboratory recognizes four categories of requests: STAT (one hour turnaround from specimen receipt), As Soon As Possible (ASAP) (2 hours), PRE-OP and ROUTINE (generally within 4 hours). An asterisk (*) beside the tests in the STAT test list (Appendix A) indicates tests that may only be ordered ASAP (not STAT).

12.2. Tests ordered "STAT" which are not on the STAT list are processed and retained for routine analysis. In unusual cases, other tests are expedited in emergencies after consultation with the on-call pathologist. ***Note*:** Some test specimens are drawn immediately (STAT), frozen or refrigerated and analyzed later.

12.3. If "STAT/ASAP" test results are expected to be delayed, requesters will be notified.

13. Patient Recall:

13.1. Inpatients: If an inpatient specimen is unacceptable due to container, preservative, inadequate volume, or clotting, the ward is notified immediately. The order will be cancelled with appropriate comments entered into CHCS/AHLTA explaining the cancellation. Ward personnel must then reorder and recollect the specimen if appropriate.

13.2. Outpatients: In most cases lab personnel will automatically contact outpatients for specimen recollection. If there are questions about special diets, medications or special requirements/protocols that the patient needs to be on in order to obtain accurate test results, the

provider is notified. Laboratory personnel will recall the patient, reorder the test in CHCS/AHLTA, and enter an explanation in the test comment section.

14. Medical-Legal Samples (Drug Abuse and Blood Alcohol):

14.1. Biological specimens (usually urine and blood) collected for use as evidence in administrative or judicial proceedings are drawn/received by laboratory personnel if 1) the individual consents to the taking or 2) it is pursuant to the drug testing program or 3) proper search authorization is given by a commander. Please refer applicable MDGI 44-178, *Withdrawal of Blood-Blood Alcohol Testing* and SGSCAC Automated Chemistry Operation Instruction (SGSCAC OI) 44-597, *Blood Alcohol Test (Ethanol).*

14.2. If results from specimens collected are needed for medical care and medical-legal purposes, then duplicate specimens are needed. The first set is handled by the Emergency Department and the second set is collected in accordance with MDGI 44-178 and SGSCAC OI 44-597.

14.3. If biological specimens are collected for both purposes, and a STAT analysis is desired for the urgent care of the patient, provide duplicate specimens(s) so the STAT specimen can be analyzed according to established toxicology procedures. The evidence specimen, with its chain of custody, is processed the next working day.

14.4. The collection and processing of routine ambulatory DRUG ABUSE URINALYSES are collected by the Demand Reduction section of Mental Health, under the provisions of Air Force Instruction (AFI) 44-120, *Drug Abuse Testing Program*.

15. Procedures to be Scheduled with Laboratory:

Table 15.1. Scheduled Laboratory Procedures.

Procedure	Section
Bone marrow examination	Hematology, Genetics
Buccal smears	Cytology
Factor assays	Coagulation
*Flow Cytometry	Hematology
Fine needle aspiration	Cytology
Glucose tolerance	Front Desk
Quantitative cultures	Microbiology
Semen analysis	Hematology
Template Bleeding Time	Front Desk
Apheresis Platelet Collection	Blood Bank
Therapeutic Apheresis Procedures	Blood Bank
Autopsy (Notification is appreciated)	Histopathology
Sweat Chloride	Front Desk
D-xylose	Front Desk
*requires pathologist approval	

16. Procedure Turnaround Time:

Table 16.1. Procedure Turnaround Time Schedule.

Autopsies	Preliminary report in 2 days. Final report may take as long as three months, but is normally available in 30 days.
Estrogen Receptors	Approximately 2 weeks.
Routine surgical biopsies	Approximately 2 days.
Most routine clinical tests performed in-house.	Within one working shift. Exceptions: STAT 1-hour, Urgent 2 hours.
Batch procedures, including most special chemistry tests.	Run at scheduled intervals. Contact lab for schedule.
Microbiology tests	2-3 days for routine cultures.
Reference lab testing	Up to 3 weeks.
Cytology requests	Approximately 2 days for non-Gyn; 5 days for Pap smears.

17. Result Reporting:

17.1. Results are reported the day the test is completed.

17.2. Outpatient Results: Routine outpatient results are printed in the Medical Center's computer center. The results are picked up by medical records technicians for filing.

17.3. Physician's Copy: A physician copy is available in CHCS/AHLTA or it is printed in the appropriate clinic. Civilian physician results will be faxed to the physician on the day the test is completed.

17.4. STAT Reports: STAT reports are generated automatically at the requester's location. The report, however, is not generated until the laboratory results are certified by a laboratory technician.

★ 17.5. Critical Value Notification: It is the policy of the laboratory to telephone the physician, nursing personnel, or responsible personnel if an unexpected abnormal result potentially indicates a life-threatening situation or the need for prompt treatment. Critical values are listed with each test. In addition to telephone notification, CHCS/AHLTA will notify the provider via Immediate Result Reporting (IRR). When a laboratory technician identifies a critical value, he/she will review the result printout for error and/or alert codes to ensure accuracy. Errors and alerts must be resolved before certifying the result. If there are no error or alert codes to address, the lab technician will immediately notify the ordering provider according to the following procedures.

17.5.1. General Requirements: All “critical” “panic” or “alert” values for specific tests listed in MDGP 44-133, *Laboratory Pamphlet*, and posted in each section will be reported according to the guidelines outlined below. ***Note:*** **The maximum time allowed between laboratory identification of a critical value and the time a provider notification is made should not exceed 30 minutes.**

17.5.2. Notification procedures.

17.5.2.1. Inpatients: The lab technician will telephone the ward where the patient is located and ask to speak to the requesting provider. If the provider is unavailable, notify attending nurse or a ward nurse.
17.5.2.2. Outpatients: During Normal Duty Hours: Call the office number and/or the pager number of the requesting provider and report result.

17.5.2.3. If requesting provider cannot be contacted, notify a clinic nurse. If the clinic nurse is unavailable, contact the on-call provider for that clinic.

17.5.2.4. As a last resort, if unsuccessful in relaying the result, notify the Emergency Department (ED) provider or ED nurse. ***Note:*** If the technician is having difficulties in contacting a responsible individual or is encountering problems getting a responsible individual to accept the result, please contact section Officer In Charge (OIC) or the on-call Pathologist. The supervisory staff member will assist in the notification of the critical value if needed.

17.5.2.5. Emergency Department Patients: Notify ED provider. In the event the requesting provider is engaged, the lab technician will ask to speak to the patient's attending nurse. If the nurse is also engaged, the lab technician may give the results to the Emergency Room Shift Leader, (the senior ranking Medical Service Apprentice on duty) with instructions to convey the results to the provider STAT.

17.5.2.6. Civilian (Network) Providers: During normal duty hours, notify the requesting provider or office nurse if the provider is unavailable. After normal duty hours, contact the civilian provider's office number and have provider contacted through their answering service. If the civilian provider does not have an emergency contact number or answering service, notify an ED provider or nurse.

17.5.2.7. Orders From Referral Locations: The Naval Construction Battalion Center, Gulfport, MS has a number that must be called in case of a CRITICAL value: [redacted] ext. 116 or [redacted] ext. 162 before 1600. After 1600 call the clinic's duty crew ([redacted]) who will in-turn contact the Duty Medical Officer to accept the result. The New Orleans Naval Air Station's number is DSN [redacted]. The Naval Home's number is [redacted]. Ask for the laboratory. If no laboratory personnel are available, ask to speak to the ward nurse. After hours, call Sick Bay at [redacted].

★ 17.6. After communicating the critical value to the requesting/responsible individual, the lab technician will ask the individual to "read-back" the critical test results. An accurate "read-back" of the critical value ensures understanding by the individual receiving the critical values. This may be repeated as necessary to ensure absolute understanding by the individual.

17.7. Notifications When There are Concerns Regarding a Patient's Status: The clinical chain shall be used to resolve questions concerning the plan of care. If there is concern/confusion after discussing the plan of care with the provider, the nurse manager/element leader could be notified.

17.8. Final Discharge Summary: This report is generated after an inpatient is discharged and all laboratory procedures are completed. The report is printed by the computer center.

18. Blood Utilization and Surgical Case Review Committee:

18.1. Meets every other month as a standing medical center committee. The committee audits 100% of all blood components transfused each month. Individual providers are contacted by the committee to clarify indications for transfusion and/or surgical procedures if either does not meet established criteria as set forth by the medical staff. Contact Blood Services Element Chief for details.

19. Research Support:

19.1. The Clinical Research Laboratory (SGAI) located just west of the Medical Center, is the initial point of contact and primary resource for research protocols.

20. Specimen Storage:

20.1. The following specimens are held in the laboratory as follows in case repeat analysis is desired:

Table 20.1. Specimen Storage Timeline.

Cerebrospinal Fluid	7 days
Leukocyte Differentials (Blood Smears)	7 days
Serum/plasma (Chemistry)	7 days
Complete Blood Count (Coulter)	3 days
Blood Bank	14 days
Blood Cultures	5 days
Random urines/24-hour urine	24 hours

21. Fasting Instructions:

21.1. Patients must fast for a variety of test procedures. The fasting period is at least eight hours prior to testing with no solid or liquid intake but water. Normal water consumption is encouraged. Additionally, lipid studies require a 12-hour fast prior to the test. The Glucose Tolerance Test requires a high carbohydrate diet for three days prior to the test. Other patient instructions are given to the patient by the **provider,** including continuance of medications, etc.

22. Premarital Testing:

22.1. The laboratory will provide required premarital testing on both the sponsor and prospective spouse. Individuals must ensure that states other than Mississippi will honor testing conducted at this facility. Contact the Family Practice Clinic to obtain appropriate lab slips.

23. Paternity Testing:

23.1. AFI 51-301, *Civil Litigation* prohibits Air Force members from providing expert testimony in private (civil) disputes. This lab, therefore does not participate in specimen collection or testing for paternity. Paternity testing is the individual member's responsibility. The testing can be performed at the member's expense by Medical & Legal Genetics, 910 Washington Avenue, Ocean Springs, Mississippi (MS) 39564, and telephone 872-3680/6476.

24. Laboratory Tests for Tricare Standard/Champus Patients:

24.1. The laboratory performs tests for patients seen by a civilian physician if the patient is Defense Enrollment Eligibility Reporting System (DEERS) eligible, and if the test is performed in-house or by another federal laboratory that does not charge for testing. The laboratory only accepts these requests on a preprinted prescription pad or lab request form showing the requesting physician's name, address and fax number. Upon completion, test results are faxed to the physicians' office.

25. Organ Donations:

25.1. Address questions regarding organ donation to Patient Affairs.

26. Specimen Collection, Freeze and Hold:

26.1. Use this laboratory test request when blood samples are to be tested at a later time. This occurs when both acute and convalescent sera are tested simultaneously. The laboratory holds the frozen specimen for 6 weeks. If samples are not tested by the sixth week, the attending physician is contacted and informed that the samples are about to be discarded.

27. Body Fluids Submitted for Multiple Analyses:

27.1. Often, body fluids are submitted for more than one test (i.e., pleural fluid submitted for culture, cytology and chemistry). This type of sample is divided/split into separate specimens for each laboratory request. This is most easily done at the time of specimen collection and is the sole responsibility of the requesting provider. Samples are not normally split or separated by laboratory personnel. Contact specimen receiving for additional information.

27.2. Body Fluid Specimen Collection. The tubes should be sterile and properly labeled with correct patient's full name, full social security number and Family Member Prefix (FMP), date and time of specimen collection, and initials of the person collecting the specimen.

27.3. The first tube should be used for microbiological tests, the second tube for chemical or serological tests, and the third tube for microscopic and cytological examination.

28. Test Method Information:

28.1. Upon request, the laboratory will provide information on test methodologies and performance specifications.

29. Referral Laboratory Service:

29.1. Specimens from other military facilities are accepted for analysis. Only tests performed in-house, listed in the table of contents, are accepted for analysis. STAT turnaround time is not provided as tests are analyzed on a routine bases.

29.2. All reference tests will be handled through our shipping department located in the laboratory during the hours of 0700-1600 Monday through Friday. Please call 376-4403 for further details or concerns. Please refer to Section L - Shipping.

Section B—Blood Bank

30. General Policies:

30.1. All specimens received for testing must be properly labeled to include full name of patient, FMP/sponsor's social security number, date and time collected, and initials of individual collecting the sample. A completed SF Form 518 must be received for each product to be transfused and must accompany the sample.

30.2. Requests should be entered into CHCS/AHLTA through order entry.

30.3. Providers will obtain an AF Form 1225, *Informed Consent for Blood Transfusion* prior to transfusion. Written consent is obtained once per hospital admission.

30.4. Caution: Never store blood products in ward/clinic refrigerators.

31. Requests for Scheduled Surgery:

31.1. Requests should be in the laboratory by 1400 the day before the surgery to ensure availability of blood by 0700 the following morning.

31.2. For Day of Surgery Admit: Complete a request at the time the surgery is scheduled. Instruct patient, in writing, to come to the lab within 48 hours prior to surgery to have a blood sample drawn.

32. Intensive Care Nursery:

32.1. ABO, Rh and antibody screen is performed on an initial pre-transfusion specimen. Cord blood is unacceptable for pretransfusion testing. Serum from the mother may be used for the antibody screen. Type O packed Red Blood Cells (RBCs) units are transfused to all neonates. When the patient is < 4 months old, in most circumstances it is unnecessary to crossmatch donor red cells for the initial or subsequent transfusions during any one hospital admission.

33. Transfusion Standards:

33.1. The specific indication for each component, Packed Red Blood Cells (PRBCs), platelets, Fresh Frozen Plasma (FFP), cryoprecipitate) transfused during a transfusion episode must be documented in the chart. The record must include an evaluation of therapeutic efficacy, based either on clinical or laboratory data. Post-transfusion laboratory data should be recorded within 24 hours of transfusion.

33.1. **Red Blood Cells**--indications:

33.1.1. Treatment of anemia in normovolemic patients who require an increase in oxygen-carrying capacity and red blood cell mass, such as patients with symptomatic anemia or chronic anemia caused by renal failure or malignancy.

33.1.2. Acute blood loss > 15% total blood volume.

33.1.3. Patients with hemoglobin < 8 g/dL (non-cardiac).

33.2. **Fresh Frozen Plasma (FFP)**--indications:

33.2.1. Bleeding patients with multiple coagulation factor deficiencies (i.e., those secondary to liver disease, Disseminated Intravascular Coagulation (DIC), and the dilutional coagulopathy resulting from massive blood or volume replacement). Patients with congenital factor deficiencies for which there is no coagulation concentrate available (Factor V or XI).

33.2.2. Principal treatment of Thrombotic Thrombocytopenic Purpura (TTP) and Adult Hemolytic Uremic Syndrome

33.3. **Platelets**--indications:

33.3.1. Bleeding caused by thrombocytopenia (usually below 50,000/μL) or for patients with functionally abnormal platelets.

33.3.2. During surgery or before certain invasive procedures in patients who have platelet counts of <50,000/μL. Prophylactic transfusion of platelets may be indicated for patients who have platelet counts below 20,000/μL associated with marrow hypoplasia resulting from chemotherapy, tumor invasion, or primary aplasia.

33.3.3. During or before neurosurgery or cardiosurgery…less than 100,000 u/L.

33.4. **Cryoprecipitate**--indications:

33.4.1. Congenital or acquired fibrinogen deficiency, Factor XIII deficiency and as a source of fibronectin.

33.4.2. Hemophilia A and von Willebrand's disease **ONLY** when virus-inactivated concentrates are not available and patient is unresponsive to Desmopressin Acetate (DDAVP).

33.4.3. Reported to be beneficial in treating bleeding tendency associated with uremia.

33.4.4. Prepare "fibrin sealant" to aid in surgical hemostasis.

33.5. **Irradiated Cellular Blood Components**--indications:

33.5.1. Patients with the following diagnosis/conditions are at risk for Transfusion Associated Graft-Versus-Host Disease (TAGVHD):

33.5.1.1. Bone marrow transplant recipients

33.5.1.2. Congenital Immune Deficiency Syndromes

33.5.1.3. Neonates receiving intrauterine transfusion or exchange transfusion

33.5.1.4. Hodgkin's Disease

33.5.2. Recipients of directed donations from a family member

33.5.2.1. Less well established guidelines include:

33.5.2.2. Hematologic malignancies other than Hodgkin's disease

33.5.2.3. Solid tumors; patients are immunosuppressed due to chemo or radiation therapy

33.5.2.4. Premature infants weighing <1200 g.

33.6. **Leukocyte Reduced Products--**indications:

33.6.1. History of repeated febrile reactions in association with RBC and/or platelet transfusions.

33.6.2. Prophylaxis against alloimmunization in selected patients who are destined to receive intensive or long-term hemotherapy. ***Note*:** The American Association of Blood Banks (AABB) has indicated that leukocyte reduction filters are as effective in preventing transmission of Cytomegalovirus (CMV) infection as are blood components obtained from CMV seronegative donors. Due to lack of availability of CMV negative products, leukocyte-reduced may be issued for a request of CMV-negative. Exceptions will be assessed and approved by the Medical Director of Blood Services.

34. Emergency Release of Blood Products:

34.1. Uncrossmatched Group O (usually Rh negative) packed red blood cells are issued for the patient within 5 minutes of request. If time permits and the sample is available, type specific blood will be issued. The requesting physician is required to sign an emergency release form and accept full responsibility for all transfusions of uncrossmatched blood. The emergency release form is provided by the blood bank and can be completed as time permits. Some type of unique identification is required for issuance of blood products. A crossmatch sample must be submitted ASAP thereafter.

35. Blood Product Issue:

35.1. Permanent party nursing personnel/providers are authorized to pick-up blood products from the Blood Bank. A permanent party member must accompany students.

35.2. The transfusion checklist (pink card) or other form of patient identification is brought in-hand to the blood bank to serve as positive identification when picking up blood products. This identification must include the patient's full name and FMP/sponsor's social security number.

35.3. Blood for more than one patient is not issued to a single courier, except for Operating Room (O.R.) Only one product is issued at a time, except for O.R. and other specific circumstances such as acutely bleeding patients.

35.4. Blood for scheduled surgery cases is issued to a courier from the O.R. each morning. Unused products should be returned to the blood bank as soon as possible after the surgery or at the end of the same duty day, at the latest. Blood is issued for cases later in the day just prior to the start of the surgery. Autologous units must be returned ASAP at conclusion of patient's surgery.

36. Blood Administration:

36.1. All blood products require the use of filters. The standard Y-set infusion set contains a mesh type blood filter (170-200 microns). Use of any IV fluid except normal saline can cause clotting or hemolysis of the blood product and is forbidden.

36.2. Blood products should be started within 30 minutes of leaving the blood bank and infused within 4 hours.

36.3. If infusion is not started within 20 minutes, return the blood product to the blood bank immediately so that the blood is not out of the Blood Bank for longer than 30 minutes.
36.4. Place the completed SF 518 original for each blood product in the patient's chart. Return a copy of the SF 518 to Transfusion Services.

37. Transfusion Reaction Procedures:

37.1. A transfusion reaction is defined as any unfavorable event occurring in a patient during or following transfusion of blood products. Symptoms include, but are not limited to: Fever, chills,

hives, anxiety, discomfort, headache, flushing, tachycardia, rash, itching, wheezing, chest pain, hypotension, nausea, vomiting, lower back pain, shock, and pulmonary edema.

37.2. All suspected reactions are treated as potentially life threatening.

37.3. The transfusion reaction protocol for immediate or suspected transfusion reactions is:

37.3.1. Stop the infusion of the blood product.

37.3.2. Keep the IV line open with normal saline.

37.3.3. Notify a physician immediately.

37.3.4. Initiate emergency procedures as necessary (Cardiopulmonary Resuscitation (CPR), etc.)

37.3.5. Call Transfusion Service and inform of transfusion reaction.

37.3.6. Collect one 7 ml (red top) clot tube and one 5 ml EDTA (purple top) tube from the opposite arm of the transfusion (avoid hemolysis). Label the samples with the patient's full name, FMP/sponsor's social security number, date and time of collection, initials of person collecting and the words "POST-REACTION."

37.3.7. Return the blood product bag, attached IV tubing and solutions to the Blood Bank.

37.3.8. Document the reaction in Section III of the SF Form 518.

37.3.9. Collect the first voided or catheterized urine from the patient. Send the urine to lab marked STAT - TRANSFUSION REACTION.

37.3.10. Additional blood products are not issued without prior approval of the Transfusion Service OIC or Technical Supervisor.

38. Rh Immune Globulin (RhIG):

38.1. RhIG is used to decrease the risk of Rh sensitization. Antenatal RhIG is given at 28-30 weeks gestation to unsensitized, Rh negative women and following any event that might cause a fetal-maternal bleed. RhIG is also given to unsensitized, Rh negative women who deliver Rh positive infants. It is also available for Rh negative patients receiving Rh positive platelets.

38.2. Submit a SF Form 518. In Section I, check Rh Immune Globulin. In remarks, write reason for order (i.e., "28" weeks, "Term", D/C).

38.3. The Blood Bank stocks RhIG.

39. Maximum Surgical Blood Order Schedule (MSBOS):

39.1. The 81 MDG utilizes the following MSBOS in order to provide cost-effective service for those patients undergoing surgical procedures. A type and screen is performed for those procedures rarely requiring red cell transfusion. If the antibody screen is negative and blood is needed intraoperatively, it can be made available within 15 minutes. Blood is crossmatched for those procedures typically requiring transfusion. If a procedure is expected to require red cell transfusion which exceeds the MSBOS, consult the Blood Services Medical Director.

Table 39.1. Maximum Surgical Blood Order Schedule Suggestions.

MSBOS

	6 Unit Crossmatch Suggested	
Cardiothoracic/Vascular Abdominal Aortic Aneurysm (AAA), Suprarenal Congenital Open Heart Surgery Cardiac Valve Replacement Coronary Artery Bypass Grafts	**General Surgery** Segmentectomy (Liver)	**Genitourinary Surgery** Radical Cystectomy
	4 Unit Crossmatch Suggested	
Cardiothoracic/Vascular AAA, Infrarenal Aortobifemoral Bypass Femoral Artery Aneurysm Esophagogastrectomy Pneumonectomy	**General Surgery** Femoropopliteal Bypass Femorofemoral Bypass Fem-Distal Bypass Whipple	**Genitourinary Surgery** Retroperitoneal Node dissection Radical Prostatectomy
Orthopedics Spinal Fusion Open Reduction	**Neurosurgery** Craniotomy	
	2 Unit Crossmatch Suggested	
Cardiothoracic/Vascular Carotid Endartectomy Thoracotomy Pericardial Window Lobectomy	**General Surgery** Hiatal Hernia Repair; Hemicolectomy; Colectomy; Splenectomy; Gastrectomy; Antrectomy and Vagotomy; Pyeloroplasty and Vagotomy; Liver Biopsy; BK and AK Amputations	**Genitourinary Surgery** Radical Nephrectomy Simple Nephrectomy Pelvic Lymph Node Dissection Prostatectomy Adrenalectomy
Obstetrics Radical Hysterectomy Placenta Previa Myomectomy Pelvic Lymph Node dissection	**Orthopedics** Total Hip Replacement Total Knee Replacement Major Limb Amputation	**ENT** Radical Neck Composite Resection

		Neurosurgery Transpehenoidal Hypophysectomy Myelomeningocele Post Cervical Decompression

ALL OTHER PROCEDURES REQUIRE A TYPE AND SCREEN (T&S) ONLY

40. Autologous Blood Donation:

40.1. Autologous blood donations involve the collection of donor units from a patient prior to a surgical procedure so the patient is transfused with his/her own blood during surgery. Autologous donation should be considered for all eligible patients. Please contact Blood Services for donation criteria.

40.2. The frequency of donation is determined by Medical Director, Blood Services in consultation with the patient's physician. There must be at least 72 hours between donations and the last donation must be made 5 days prior to the scheduled surgery. A Pathologist reviews the patient's history and laboratory results prior to donation to determine eligibility.

40.3. Requesting physician responsibilities:

40.3.1. Explain the procedure to the patient including risks and benefits and obtain a signed Autologous Consent Form.

40.3.2. Complete the Keesler AFB Form 405, *Requesting Physician Instructions for Autologous Donations***,** Keesler AFB Form 405A, *Statement of Consent for Autologous Donation* in triplicate including the scheduled surgery date, diagnosis, and number of requested units. The patient brings the signed consent form and a copy of the Autologous Instructions to the Blood Services prior to first donation for prescreening and scheduling.

40.3.3. Provide the patient with prescriptions for iron supplements as necessary.

40.3.4. At 24 to 48 hours prior to surgery, submit one SF Form 518, for each autologous unit and a properly labeled patient blood sample to the blood bank. In the Remarks block in Section I indicate "AUTOLOGOUS BLOOD." If the patient's surgery is canceled or delayed or if the patient does not require transfusion, the requesting physician should notify Blood Services as soon as possible. The blood will not be used for another patient and will be destroyed at the expiration date

41. Blood Bank Critical Values:

41.1. Physicians will be notified of any patient having an unexpected antibody, positive Direct Antigen Test (DAT), positive fetal screen, and/or Kleihauer Betke. Notification of antibody identification will follow when testing is completed.

Table 41.1. Blood Bank Test Availability/Comments.

BLOOD BANK		
TEST	SPECIMEN	AVAILABILITY TIME AND COMMENTS
Antibody Screen (IAT)*	5 mL Purple Top	1-hour; **Critical Value – Positive**
Antibody Identification*	(2) 5 mL Purple Tops	2 hours or longer depending on difficulty of identification; **Critical Value**
Antibody Titer	5 mL Purple Top	2 hours
Antigen Typing	5 mL Purple Top	2 hours
Blood Group (ABO/Rh)	5 mL Purple Top	Fifteen minutes; One purple microtainer needed on infants
Cryoprecipitate AHF	Specimen not needed if patient typed this Admission	Requires 30 minutes - 1 hour for preparation. 1 SF Form 518 can be used to request a pool of 6-10 units Expires 4 hours after pooled.
Direct Antiglobulin* (DAT)	3 mL Purple Top	30 minutes; **Critical Value – Positive**
Fresh Frozen Plasma (FFP)	Specimen not needed if patient typed admission	Requires 45 minutes for preparation. Expires 24 hours after thaw.
Irradiated Blood or Platelets	5 mL Purple Top	Requires 1 hour for preparation; not be performed until just prior to issue.
Iso-hemagglutinin Titer	5 mL Purple Top	2 hours
Platelets	Specimen not needed if patient typed this admission	Issued in 6 packs at this facility. One SF Form 518 per 6 platelets. Requires 30 minutes to 1-hour to prepare. Expires 4 hours after pooling.
Platelets Pheresis	Specimen not needed if patient typed admission	If specimen already submitted this admission, then prep time is 15 minutes.
Red Blood Cells	5 mL Purple Top	STAT request available 45 minutes after specimen received. For infants two pink top microtainers are required.
Rh Immune Globulin	5 mL Purple Top	Post delivery requires a 5 ml purple top; 1-hour to complete.
Rh Type	5 mL Purple Top	30 minutes; one purple microtainer needed on infants.
Transfusion Reaction	7 mL Red Top, 5 mL Purple Top, & first voided urine	Approximately 2 hours depending on the extent of the reaction. Final report is issued as consultation.
Type and Crossmatch	5 mL Purple Top	Specimen is held for 72 hours. Requires 1-hour preparation time.
Type and Screen	5 mL Purple Top	Specimen is held for 72 hours. Requires 1-hour preparation time.

Section C—Serology

Table 41.2. Serology Testing Availability/Comments.

SEROLOGY			
TEST	**SPECIMEN**	**REFERENCE RANGE**	**COMMENTS**
Antinuclear Ab (ANA) Screen	7 mL Red Top	Negative	Performed Monday - Friday. If positive, test is sent out for confirmation, titer and pattern.
Bacterial Ag Detection	CSF, Serum, Urine	Negative	CSF available **STAT 24 hours**. Serum & Urine; Routine only. Negative CSF is followed up with culture.
Cryptococcal Ag Latex Test	7 mL Red Top 1 mL CSF	Negative	**STAT 24 hours** on CSF only. Monday - Friday Serum: Routine
Mono	7 ml Red Top	Negative	Performed Daily: Monday-Friday
PR	7 mL Red Top	Negative	Performed Daily. If positive, test is sent out for confirmation.
RF	7 mL Red Top	Negative	Performed Daily. If positive, titer is performed.
Streptozyme	7 mL Red Top	Negative	Performed Daily. If positive, titer is performed.

Section D—Chemistry

42. Urine Chemistries:

42.1. **24-Hour Urines** are performed daily on normal duty days only. See Section 48 for instructions on proper collection of 24-hour urine samples. Tests performed on 24-hour urines are not available on a **STAT** or **URGENT** basis. Urine specimens received NLT 0730 will be included in the daily run.

42.2. In order to calculate **creatinine clearance** on a timed urine specimen, chemistry must receive a specimen for serum/plasma creatinine within 24 hours of the urine collection.

43. Therapeutic Drug Testing:

43.1. If needed, therapeutic drug levels are available on a STAT basis.

43.2. Our facility uses a standardized dosing schedule for timed antibiotic administration. The laboratory ward round schedule and scheduled therapeutic drug analyses are aligned with the dosing schedule to increase the opportunity for lab phlebotomists to collect some antibiotic peak and trough specimens during routine ward rounds, when the peak or trough time coincides with

ward round times. Ward personnel are responsible to collect drug level specimens when collection times differ from the routine ward round schedule. For therapeutic drug testing **both** the specimen collection tube and the request form must be labeled with the date and time collected **and** whether the specimen is a peak or trough sample**.** The CHCS/AHLTA order should contain a comment as to whether sample is trough or peak specimen.

44. Glucose Tolerance Testing:

44.1. Glucose Metabolism Screens:

44.1.1. The Obstetrics (OB) glucose metabolism screen does not require an appointment. The requester should instruct the patient to report to the laboratory. The same guidelines for patient preparation outlined below for the Oral Glucose Tolerance Test (OGTT) apply except for the three-day dietary preparation requirement.

44.1.2. The screen for non-pregnant patients is a fasting and a two-hour post-glucola plasma glucose test. The Glucola and load contains 75g of glucose.

44.1.3. The screen for pregnant patients is 50 grams of glucose with a one-hour plasma glucose sample. **This screening test does not have to be performed under fasting conditions unless specifically requested by the provider.**

44.2. Oral Glucose Tolerance Test (OGTT)

44.2.1. An OGTT is done by appointment only. The patient must obtain this appointment in person from the Laboratory Operations desk in the laboratory so that written instructions are provided. The test must begin prior to 0900 on the day that it is scheduled. (See the introduction of this guide for hours of operation.)

44.2.2. The current schedule allows for a total of three patients per normal duty day for any combination of glucose, or xylose tolerance tests.

44.3. Patient Preparation for an OGTT.

44.3.1. The patient maintains regular activity and intake of not less than 150 grams of carbohydrate per day for the three days immediately prior to the test date. By recommendation of the OB/GYN clinic pregnant females do not need the loading diet as they are already consuming at least 150 grams of carbohydrate per day.

44.3.2. The night before the scheduled test, the patient must fast 8 - 12 hours. Normal water consumption is encouraged.

44.3.3. Continued intake of medication which may affect the OGTT is at the discretion of the requester and is specially considered and discussed with the patient at the time the test is ordered.

44.4. Conducting the OGTT.

44.4.1. The test begins between 0700 and 0900.

44.4.2. The patient will remain at rest in the laboratory reception area for the duration of the test. No smoking is allowed. Normal water consumption is encouraged.

44.4.3. The patient's fasting condition is assessed by a blood glucose Accu-chek test. If elevated, a fasting plasma glucose is run STAT prior to administering the glucose load. If the fasting plasma glucose is greater than or equal to 126 mg/dL the NCOIC, Laboratory Operations, will contact the requesting healthcare provider and advise that the OGTT may not be indicated. If the provider believes the test is still justified, he should coordinate with a pathologist to obtain approval. The OB healthcare provider will be contacted by the lab if the fasting plasma glucose is greater than 126 mg/dL to determine if the glucose load should be administered.

44.4.4. Non-pregnant adult patients are given a 75-gram glucose load. Children and small adults will receive 1.75 g/kg of body weight. Blood specimens for plasma glucose are collected at the fasting, and 2-hour points. No urine samples are collected.

44.4.5. Pregnant patients are given 100 grams of glucose in accordance with the criteria of O'Sullivan and Mahan (see references). Blood specimens for plasma glucose are collected at the fasting, 1-, 2-, and 3-hour points. No urine samples are collected.

45. Lactose Tolerance Test (LTT):

45.1. This test is no longer offered.

46. D-Xylose Absorption Test:

46.1. An appointment is made by the patient at the central processing desk in the laboratory. The test must start between 0700 and 0900 on the day that it is scheduled.

46.2. No dietary preparation is required. A 12-hour fast is required.

46.3. The requesting provider must write a prescription for the correct amount of d-xylose and have the patient fill the prescription at the pharmacy prior to the scheduled test. The laboratory will mix the d-xylose with water.

46.4. Doses are normally 25 grams or 5 grams. Adverse reactions with the 25-gram dose may include nausea, intestinal bloating, borborygmi, cramping and diarrhea. These symptoms may last for a few hours.

46.5. The patient will void and discard the first urine specimen. Next, the prescribed dose dissolved in water is administered orally with sufficient additional water to generate adequate urine flow (> 60 ml/hr). All urine in the next five hours is collected in one container. Also, a blood sample for d-xylose determination is collected at the 2-hour point.

46.6. The patient will remain fasting and rest in the laboratory reception area for the duration of the test; normal water intake is encouraged. The patient cannot smoke during the collection period.

47. 24-Hour Urine Collection:

47.1. All timed urine specimen collections for urine chemistries are collected in a clean plastic container with appropriate preservatives. Send the patient to the laboratory central processing desk or, for inpatients, have someone come to the laboratory for the container with the appropriate preservative. The only 24-hour urines that are collected with preservatives are those that require addition of preservative prior to sample collection. See table for list. All other 24-hour urine specimens are collected without preservatives and either kept on ice or refrigerated until submitted to the laboratory for processing. Written instructions are provided to the patient.

47.2. The individual tests in some test batteries require different preservatives and, therefore, more than one 24 hour collection; however, in other instances only one specimen is required. We are glad to assist you on a case-by-case basis. Please direct any questions to Central Processing, at 376-4460 or 376-4403.

47.3. The urine specimen is kept refrigerated during collection and brought directly to the laboratory upon completion. The Operation section will measure the total volume and dispense aliquots of the specimen for the various analytical sections or reference laboratories involved in testing.

47.4. The procedure for collecting the specimen is as follows:

47.4.1. A large, clean plastic container is obtained with at least a one-gallon capacity. If more than one-gallon collection is anticipated, multiple containers are obtained before collection starts.

47.4.2. The patient's name, FMP-SSAN and date of collection (including date and time begun and date and time completed) are written on a firmly attached label. If more than one container is used, also indicate the total number of containers involved, e.g., 1 of 3, 2 of 3, and 3 of 3.

47.4.3. Collection is best accomplished by voiding into a smaller container and pouring that sample into the larger collection container. The large container is refrigerated at all times until the entire specimen is delivered to the lab.

47.4.4. On commencing the collection (day 1), the patient empties his/her bladder upon arising in the morning. This specimen is discarded.

47.4.5. The next voided specimen is collected and poured into the collection container. All subsequent urine specimens are collected for a 24-hour period and added to the container.

47.4.6. Upon arising the second morning, the first voided specimen is collected rather than discarded, and also added to the specimen container.

47.4.7. This completes the collection. Continue to refrigerate the sample until it is delivered to the laboratory.

48. Common Errors:

48.1. Both of the morning specimens are added to the container. ***Note:*** That only the one from the second morning is retained.

48.2. Both of the morning specimens are discarded.

48.3. One (or more) of the within-day specimens is not added to the container. If this happens, get a new container, and start over the next day.

48.4. The large collection container is accidentally spilled. If this happens, get a new container, and start over the next day.

48.5. If more than a single day's specimen is collected in a sequential fashion (say 24 hour specimen on each of three consecutive days), the patient gets mixed up and sequentially adds each urine specimen collected throughout each day to each of the containers in turn; or, the patient pours a bit of each sample into each of the containers. In either case, the samples from each single day are not kept separately, completely invalidating the test.

49. General Comments:

All of the information above is designed to describe the usual set of offerings and conditions in the laboratory's core lab. If you have questions or concerns, please contact the Technical Supervisor of Chemistry or OIC, Chemistry.

Table 49.1. Chemistry/Special Chemistry Testing Availability/Comments.

★CHEMISTRY AND SPECIAL CHEMISTRY ***Note*: Serum Specimens = Red Top Tubes; Plasma Specimens = Green Top (Lithium Heparin) Tubes**			
TEST	**SPECIMEN**	**REFERENCE RANGE**	**COMMENTS**
Acetaminophen	Plasma	10 - 30 ug/mL	**Critical >40 ug/mL**
Albumin*	Plasma	3.5 - 5.0 g/dL	
Alcohol, Ethyl	Plasma (grey top) Collect specimen using non-alcoholic germicidal skin cleanse.	None Detected	Alcohol testing for medical purposes is processed as a clinical specimen. If a legal blood alcohol test is required a specimen chain of custody is required; results are released through the

			81 MDG Patient Release Information Department.
ALKALINE PHOS *	Plasma	50 - 136 IU/L	
AFP-Tumor Marker*	Serum	0 - 5 ng/mL	
ALT (SGPT) *	Plasma	30 - 65 IU/L	
Ammonia	Plasma	11 - 32 umol/L	Collect the specimen using standard Venipucture technique and immediately place on ice. Transport to the laboratory immediately for processing and testing.
Amylase	Plasma Urine	25 - 115 IU/L 59-401 IU/24hr	
AST (SGOT)	Plasma	15 - 37 IU/L	
Beta-HCG*	Serum	Nonpregnant female 0-5 mIU/ml	
Bilirubin, Direct*	Plasma	0 - 0.30 mg/dL	
Bilirubin, Total*	Plasma	≤ to 1.0 mg/dL	**Critical Value (all ages): >15 mg/dL**
Blood Urea Nitrogen (BUN) *	Plasma Urine	7 - 18 mg/dL 7 - 20 gm/24 hours	
Calcium *	Plasma Urine	8.5 -10.1 mg/dL 42 - 353 mg/24 hours	**Critical Value (plasma-all ages): <7 or >13 mg/dL** Random urine specimens are not routinely tested for calcium. Coordinate special requests (e.g., pediatric pseudo-hypothyroidism) with lab.

CHEMISTRY AND SPECIAL CHEMISTRY ***Note*: Serum Specimens = Red Top Tubes; Plasma Specimens = Green Top (Lithium Heparin) Tubes**			
TEST	**SPECIMEN**	**REFERENCE RANGE**	**COMMENTS**
Carbamazepine	Plasma	4 - 12 ug/mL	**Critical Value: >15 ug/mL**
CEA *	Serum	0 – 2.5 ng/mL	Carcinoembryonic Antigen
Chloride *	Plasma Urine	98 - 107 mmol/L 110 - 250 mmol/L	**Critical Value: <75 or >126 mmol/L**
Cholesterol	Plasma	< 200 mg/dL	
Cholesterol, HDL*	Plasma	< 40 mg/dL	
Cholesterol, LDL*	Plasma	< 100 mg/dl Desirable 130 -159 Borderline/High Risk > 160 mg/dl High Risk	This is a calculated value and is only provided as part of lipid panel
CK (CPK) *	Serum	Male: 35 - 232 IU/L Female: 21 - 215 IU/L	
CK-MB *	Plasma	0 – 3.6 ng/mL	**Critical Value: > 5 ng/ml**
CO_2	Plasma	1 day-1 year: 16-28 mmol/L Adult: 21-32 mmol/L	**Critical Value (all ages): <11 or >40 mmol/L**
Cortisol *	Serum	A.M.: 5 - 25 ug/dL P.M.: 2.5 - 12.5 ug/ml	
Creatinine *	Serum/Plasma Urine	Male: 0.8 - 1.3 mg/dL Female: 0.6 - 1.0 mg/dL Male: 800-2000 mg/24hrs Female: 600-1800 mg/24 hrs	
Creatinine Clearance	Urine and Plasma		In order to calculate on a timed urine a specimen, plasma creatinine must be received within 24 hours of urine collection.
Digoxin*	Serum/Plasma	0.9 - 2.0 ng/mL	**Critical Value: >2 ug/mL**
Estradiol *	Serum Males: Females: Oral contraceptives: Postmenopausal: Treated: Untreated:	0 -56 pg/mL 0 - 102 pg/ml 0 - 93 pg/ml 0 - 30 pg/ml	Menstruating female (by day is cycle relative to LH peak)

CHEMISTRY AND SPECIAL CHEMISTRY ***Note*: Serum Specimens = Red Top Tubes; Plasma Specimens = Green Top (Lithium Heparin) Tubes**			
TEST	**SPECIMEN**	**REFERENCE RANGE**	**COMMENTS**
Ferritin *	Serum	Male: 5 - 244 ng/mL Female: 3 - 105 ng/mL	
Folate	Serum	Normal: 3 - 17 ng/mL	
Follicle Stimulating Hormone (FSH)	Serum Males: Females: Follicular Phase: Mid-Cycle Peak: Luteal Phase: Postmenopausal:	0.7 - 11.1 mIU/mL 2.8 - 11.3 mIU/mL 5.8 - 21.0 mIU/mL 1.2 - 9.0 mIU/mL 21.7 - 153 mIU/mL	
Free T3	Serum	1.8 - 4.2 pg/ml	
Free T4	Serum	0.8 - 1.9 ng/dL	
Gentamicin	Plasma	Peak: 4 - 8 ug/mL Trough: <2.0 ug/ml	Peak samples should be drawn one hour after dose administration **Critical Value: Peak >10 ug/mL** **Trough >2 ug/mL**
GGT (GGTP) *	Plasma	Males : 15 - 85 U/L Females : 5 - 55 U/L	
Glucose *	Plasma Urine, random CSF Urine 24 hr	74 - 106 mg/dL 1 -15 mg/dL 40 - 70 mg/dL <0.5 g/24 hr	**Plasma Critical: <40 or >500mg/dL** **CSF Critical: <29 or >150 mg/dL**
Glucose-6-Phos Deficiency (G6PD)	Whole Blood	4.6-13.5 ug/Hgb	
Glucose Metabolism Screen (No appointment required)	Plasma		Patient preparation is same as for OGTT. Screen for non-pregnant patients is a fasting and a 2-hour post-glucola (75 g load) plasma glucose test. For pregnant patients the glucola load is 50 g with a one hour plasma glucose sample.
Glucose Tolerance Test (Appointment required. See notes preceding this table for patient preparation.)	Plasma		OGTT will not be scheduled unless an appropriate glucose metabolism screen is accomplished first. A fasting plasma glucose of 126 mg/dl or greater on more than one occasion is diagnostic. No OGTT is indicated. Inpatient OGTTs, unrelated to growth Hormone, will not be done.

CHEMISTRY AND SPECIAL CHEMISTRY *Note*: Serum Specimens = Red Top Tubes; Plasma Specimens = Green Top (Lithium Heparin) Tubes			
TEST	**SPECIMEN**	**REFERENCE RANGE**	**COMMENTS**
Hemoglobin A1C ($HgbA_1C$)	Whole Blood	4.7 - 6.4 %	
Homocysteine*	Serum	5.0 - 12.0 umol/L	
Immunoglobulin* IgG IgA IgM	Plasma	 681 - 1648 mg/dL 87 - 474 mg/dL 48 - 312 mg/dL	
Insulin*	Serum	3 - 29 uIU/ml	
Iron *	Plasma	35 - 150 mg/dL	
Ketones	Plasma Urine	Negative Negative	
Lactate (Lactic Acid)	Plasma	0.4 - 2.0 mmol/L	Collect specimen and place on ice immediately. Transport specimen to the laboratory immediately. Delay in testing or specimen hemolysis will invalidate test results
LD (LDH)	Serum/Plasma	100 - 190 IU/L	
Lipase	Serum/Plasma	114 - 286 IU/L	
Lithium	Serum	0.6 - 1.2 mmol/L	0.6 -1.2 mmol/L is the therapeutic range **Critical Value: > 1.5 mmol/L** > 2.5 mmol/L can result in Severe Toxicity
Leutenizing Hormone (LH) *	Serum Males: Females: Follicular Phase: Mid-Cycle Peak: Luteal Phase: Postmenopausal: Contraceptives:	 0.8-1.6 mIU/mL 1.10 - 11.6 mIU/mL 17.0 - 77.0 mIU/mL 0 - 14.7 mIU/mL 11.3 - 39.8 mIU/mL 0 - 8.0 mIU/mL	
Magnesium*	Plasma Urine	1.8 - 2.4 mg/dL 44 - 255 mg/dL	**Critical Value:** **<1.0 or >4.9 mg/dL**
Microalbumin*	24 Hour Urine Random	<30 mg/24 hrs 1 - 25 mg/L	
Osmolality	Serum/Plasma Urine	275 - 295 mOsm/L 300 - 900 mOsm/L	

CHEMISTRY AND SPECIAL CHEMISTRY ***Note*: Serum Specimens = Red Top Tubes; Plasma Specimens = Green Top (Lithium Heparin) Tubes**			
TEST	**SPECIMEN**	**REFERENCE RANGE**	**COMMENTS**
Panels Basic Metabolic * Comprehensive Metabolic * Electrolyte Hepatic Function Lipids Renal Function Iron	Plasma	See values given for individual tests	 **Basic Metabolic** = Ca, CO_2, Cl, Cr, Glu, K, Na, BUN **Comprehensive Metabolic** = Alb, Tbil, Ca, CO_2, CI, Cr, Glu, ALP, K, TP, Na, ALT, AST, BUN **Electrolyte** = Na, K, CI, CO_2 **Hepatic Function** = Alb, TBil, DBil, Phos, TP, ALT, AST **Lipids** = Chol, Trig, HDL, LDL **Renal Function** = Alb, Ca, CO_2, Cl, Cr, Glu, Phos, K, Na, BUN **Iron** = Iron, IBC Total, IBC Unsat, Iron SAT, Transferrin
Phenobarbitol	Plasma	15 - 40 ug/mL	**Critical Value: >40 ug/mL**
Phenytoin	Plasma	10 - 20 ug/mL	**Critical Value: >20 ug/mL**
Phosphorus*	Plasma Urine 24hr	2.5 - 4.9 mg/dL 0.4 - 1.3 g/24hr	**Plasma Critical Value: <1.2 or >8.9 mg/dL**
Potassium*	Plasma Urine	3.5 - 5.1 mmol/L 25 - 125 mmol/L	**Plasma Critical: Adult: <3.0 or >6.5 mmol/L, Day-1Month: <2.4 or >8.1 mmol/L**
Prealbumin	Plasma	18 - 35.7 mg/dL	
Pregnancy screening Test	Serum Urine	Negative	If urine is used, the first morning voided sample is the specimen of choice
Prolactin *	Serum Males: Females:	 2.5- 17.0 ng/mL 1.9 - 25.0 ng/mL	

CHEMISTRY AND SPECIAL CHEMISTRY *Note*: Serum Specimens = Red Top Tubes; Plasma Specimens = Green Top (Lithium Heparin) Tubes			
TEST	**SPECIMEN**	**REFERENCE RANGE**	**COMMENTS**
Progesterone *	Serum Male: Female: Follicular: Luteal: Mid-luteal: Post-menopausal:	 0.27 - 0.9 ng/mL 0 - 1.13 ng/mL 0.95 - 21 ng/mL 6.0 – 24 ng/mL 0 - 1.0 ng/mL	
PSA, Total*	Serum	Normal : 0. .05- 4 ng/mL Grey zone: 4.1-10.0 ng/ml	
PSA, Free*	Serum	0 .05- 0.8 ng/ml	
PTH, Intact*	Serum	11 - 67 pg/ml	
Salicylate*	Plasma	2.8 - 20.0 mg/dL	**Plasma Critical Value: >30 mg/dL** Concentrations > 30 mg/dL are considered toxic. Concentrations greater than 60 mg/dL can be lethal.
Sodium	Plasma Urine	136 - 145 mmol/L 40 - 220 mmol/L	**Plasma Critical Value: <119 or >159 mmol/L**
Sweat Chloride	Induced Sweat	Neg = < 60 mmol/L Equivocal = 61-80 Pos = > 80mmol/L	
Testosterone *	Serum: Male Age 0-49 yrs Male Age >50 Female: Ovulating Postmenopausal	Male 286 - 1510 ng/dL 212 - 742 ng/dL 65 - 119 ng/dL 49 - 102 ng/dL	
Theophylline*	Plasma (therapeutic range)	10 - 20 ug/mL	In some cases, the most effective therapeutic level may be outside these ranges. Monitor patients for efficacy of treatment and for adverse symptoms. **Adult Critical: >20 ug/mL** **Neonate Critical: >10 ug/mL**
Thyroid Stimulating Hormone (TSH) *	Serum	0.4 - 5.0 uIU/mL	TSH is performed as a screen for thyroid abnormalities, if the TSH is abnormal a Free T4 is automatically performed.
Tobramycin*	Plasma	4 - 8 ug/mL	**Critical Value: (peak) >10 ug/mL, (trough) >2 ug/mL**

CHEMISTRY AND SPECIAL CHEMISTRY ***Note*: Serum Specimens = Red Top Tubes; Plasma Specimens = Green Top (Lithium Heparin) Tubes**			
TEST	**SPECIMEN**	**REFERENCE RANGE**	**COMMENTS**
Total Iron Binding Capacity*	Plasma	250 - 450 ug/dL	
Total Protein*	Plasma CSF Urine: Random 24-Hour	6.4 - 8.2 g/dL 15 - 45 mg/dL <11.9 mg/dl <149.1 mg/24hr	
Transferrin	Plasma	Male: 202 - 364 mg/dL	
Triglycerides	Plasma	< 200 mg/dL	Fasting specimen is required.
Troponin I	Plasma	<0.0 - 0.05 ng/mL	Any condition resulting in myocardial cell damage can potentially increase cardiac Troponin I levels above the expected value. Clinical studies have documented these conditions to include unstable angina, congestive heart failure, myocarditis, and cardiac surgery or invasive testing. Use of this test should reflect current practice and criteria for AMI diagnosis. Serial sampling may be required to detect elevated levels. **Critical Value: >1.5 ng/mL**
Uric Acid *	Plasma Urine	Male: 3.5 - 7.2 mg/dL Female: 2.6-6.0 mg/dL 150 - 990 mg/24 hrs	
Vitamin B12 *	Serum	Normal: 193 - 982 pg/mL	

CHEMISTRY AND SPECIAL CHEMISTRY ***Note*: Serum Specimens = Red Top Tubes; Plasma Specimens = Green Top (Lithium Heparin) Tubes**			
TEST	**SPECIMEN**	**REFERENCE RANGE**	**COMMENTS**
Urine, 24 Hours	Urine. Containers with appropriate preservatives are available in the laboratory. Specimens that do not require a preservative are kept on ice or refrigerated until submitted. Written instructions are provided to the patient. See text for collection directions.	See individual tests	Performed once daily on normal duty days. The following tests require a preservative. Catecholamines 25 ml 6N HCL Homovanillic 25 ml 6N HCL Heavy metals 20 ml 6N HCL 5-HIA 20 ml 6N HCL Metanephrin 20 ml 6N HCL Oxalate 20 ml 6N HCL VMA 20 ml 6N HCL Citric acid (citrate) 20 ml 6N HCL 17-hydroxycorticosteriods 10gm Boric acid 17-ketosteroids 10 gm Boric acid Niacin metabolites 10 gm Boric acid Pregnanediol 10 gm Boric acid
Urine, Drugs of Abuse	Amphetamine/Meth Barbituate Benzodiazepine Cannabinoid Cocaine Metabolite Opiate Phencyclidine PCP	Negative Negative Negative Negative Negative Negative Negative	This is a medical test only. (LEGAL drug screens are referred to Brooks AFB, Texas as part of the Air Force Drug Screening Program.). All POSITIVE drug screens are held for one month.
Valproic Acid	Plasma	50 - 100 ug/mL	**Critical Value: 110 ug/mL**
Vancomycin	Plasma	Trough: 5 - 10 ug/mL 30 min peak: 30 - 40 ug/mL 1-hour peak: 25 -40 ug/ml 2 hour peak: 18 -26 ug/ml Indicate time of collection and label peak or trough	**Critical Value: >10.0 ug/mL** **Critical Value: >40.0 ug/mL** Trough samples should be drawn immediately prior to dose administration. Peak samples should be drawn one hour after dose administration

Section E—Hematology

Table 49.2. Hematology Test Availability/Comments

★HEMATOLOGY AND HEMOSTASIS			
TEST	**SPECIMEN**	**REFERENCE RANGE**	**COMMENTS**
Activated Partial Thromboplastin Time (APTT)	Citrated Plasma	23.9 - 36.4 seconds	**Critical Value: > 90 seconds**
APT Test	Gastric Contents	Negative	This test is used to differentiate between fetal and maternal blood in the gastric contents of a neonate.
Body Fluid Examination	Various Body Fluids Collected in EDTA or Heparin to prevent clot formation CSF collected in designated CSF collection tubes	Reference Ranges are dependent on the fluid type analyzed and can be found in CHCS/ AHLTA or as part of the patient report	
Semen Analysis	Semen pH: Count: Volume: Appearance: Viscosity: Motility: Initial: Morphology:	7.0 - 8.0 60 - 150 x 10^6 / ml 1.5 - 5.0 ml Normal Normal 60 - 100 %Motile 70 - 100 % Normal	Sample must be collected and delivered to the laboratory within 30 minutes. Any abnormalities seen in the sample will be reported.
Urinalysis Glucose: Bilirubin: Ketones: Specific Gravity: Blood: pH: Protein: Urobilinogen: Nitrite: Leukoesterase:	Random Urine	 Negative Negative Ketones 1.005 - 1.025 Negative 5.0 - 7.5 Negative 0.2 - 1.0 mg/dL Negative Negative	

★HEMATOLOGY AND HEMOSTASIS			
TEST	**SPECIMEN**	**REFERENCE RANGE**	**COMMENTS**
CBC with Differential	Whole Blood (EDTA)		
WBC Count*:		4.5 - 11.0 $x10^3/mm^3$	**Critical Value: <1 or >37 x $10^3/mm^3$**
RBC Count:		4.3 - 5.9 $x10^6/mm^3$	
Hemoglobin*:		13.9 - 16.3 gm/dL	
Hematocrit:		39 - 55 %	**Critical Value: <7 or >20 g/dL (>22 g/dL if newborn)**
MCV:		79 - 100 fL	
MCH:		25.4 - 34.6 pg	**Critical Value: <15 or >65%**
MCHC:		30 - 37 %	
RDW:		11.5 - 14.5 %	
Platelet Count*:		150 - 450 $x10^3/mm^3$	**Critical Value: <40 or >1000 x $10^3/mm^3$**
MPV:		7.4 - 10.4 fL	
Neutrophil %:		35.2 - 78.5 %	
Lymphocyte %:		16 - 39 %	
Monocyte %:		1.4 - 11.6 %	
Eosinophil %:		0 - 5.5 %	
Basophil %:		0 - 2 %	
Neutrophil Count:			
Lymphocyte Count:		1.6 - 8.8 x $10^3/mm^3$	
Monocyte Count:			
Eosinophil Count:		1.25 - 3.38 $x10^3/mm^3$	
Basophil Count:		0.13- 0.86 $x10^3/mm^3$	All reference ranges shown are for adult males. Age and sex specific ranges are available in CHCS/ AHLTA and are printed on each patient report.
		0 - 0.4 $x10^3/mm^3$	
		0 - 0.2 $x10^3/mm^3$	
D-Dimer Profile includes:	Citrated Plasma		
D-Dimer (Auto)*		<0.48 FEU ug/mL	
D-Dimer		<200 mg/mL	
Eosinophil Count	Nasal Smear	Abnormal: Few or more:	
	Urine	Not normally found in urine	
Erythrocyte Sedimentation Rate (ESR)	Whole Blood (EDTA)	Male: 0-50 y/o: 0-15 mm/hr > 50 y/o: 0-20 mm/hr Female: 0-50 y/o: 0-20 mm/hr > 50 y/o: 0-30 mm/hr	

★HEMATOLOGY AND HEMOSTASIS			
TEST	**SPECIMEN**	**REFERENCE RANGE**	**COMMENTS**
Fibrin Degradation Products (FDP)	Citrated Plasma	< 5.0 ug/mL	
Fibrinogen*	Citrated Plasma	200 - 436 mg/dL	**Critical Value: <75 or >775 mg/dL**
International Normalized Ratio (INR)	Citrated Plasma	1.0, varies according to therapeutic condition being followed	INR is part of the normal Protime (PT) procedure and will be reported along with PT values. **Critical Value: ≥ 6.0**
In-Utero Platelet Evaluation of Percutaneous Umbilical Blood	Percutaneous Umbilical Blood	> 50,000/mm^3	Platelets present at a concentration of greater than 50,000 falls within the normal range for a safe delivery
Leukocyte Alkaline Phosphatase (LAP score)	Peripheral Blood	32 - 182	Used primarily to differentiate a leukomoid reaction from chronic myelocytic leukemia, contact laboratory to schedule study.
Mixing Studies	Citrated Plasma	See CHCS/AHLTA	Used to differentiate factor deficiency from presence of inhibitors as causes of abnormal PT and APTT. Contact pathologist for assistance with interpretation.
Platelet Aggregation	Platelet-Rich Plasma	Interpreted by pathologist	Call hematology lab to schedule.
Protime (PT)*	Citrated Plasma	12.0 – 15.0 seconds	**Critical Value: >51 seconds**
Reticulocyte Counts	Whole Blood (EDTA)	Adults: 0.5-1.5% Infants: 2.0-6.0%	
Thrombin Time	Citrated Plasma	<21.0 seconds	

Section F—Microbiology

50. General Information:

50.1. Clinicians are responsible for collecting all specimens for culture except urine cultures on ambulatory patients. Microbiology technicians are available weekdays from 0700-1700 and on weekends, holidays, and Compressed Work Schedule (CWS) Fridays from 0700-1600; specimen collection for culture is limited to these times whenever possible.

50.2. Laboratory request forms or CHCS/AHLTA generated orders must include:

50.2.1. Patient's full name

50.2.2. Birth date

50.2.3. Register number

50.2.4. Sex

50.2.5. FMP-SSAN (For dependents, give military sponsor's SSAN and dependent's family member prefix.).

50.2.6. Doctor: (provider stamp and signature)

50.2.7. Time of collection

50.2.8. Date

50.2.9. Source of specimen

50.2.10. Specify diagnosis when significant

50.2.11. Specify antibiotic therapy

50.2.1. Organism isolates which are resistant to antibiotic therapy noted in CHCS/AHLTA are considered critical values and reported in accordance with (IAW) Section 17.4.

50.3. After inoculating the swab with culture material, place it back into the tube holder and crush the ampule so the liquid solution saturates the swab. Label the Culturette and attach a request form to the Culturette using a paper clip or a rubber band. **DO NOT** use staples. A separate swab is required for each culture request, i.e., one for bacterial culture, one for fungal culture, one for gram stain, etc.

50.4. Transport all cultures to the lab as soon as possible after collection. Anaerobic transport tubes, viral transport tubes, and Culturette swabs containing transport media are suitable for maintaining the viability of most organisms. CSF cultures, blood cultures, and cultures where

fastidious organisms are suspected (e.g., *Neisseria, Bordetella*, etc.) must be delivered immediately.

51. Specimen Rejection Criteria:

51.1. Specimens are rejected for the following reasons:

51.2. Unlabeled specimen or demographic discrepancies between specimen and form.

51.3. Specimen submitted is improper for test requested. Examples include submission of stool for pinworm analysis, submission of 24-hour sputum, stool, or urine culture, and submission of saliva for sputum culture.

51.4. Gross external contamination of the container. The specimen is disposed of with contaminated waste.

51.5. Specimen submitted in fixative (except polyvinyl alcohol (PVA) preserved stools for ova and parasite examination).

51.6. Stool specimens submitted in a diaper or tissue paper.

51.7. Foley catheter tips are unsuitable for culture.

51.8. Aerobic swab submitted for anaerobic culture.

51.9. Gram stain for gonococcus on vaginal or anal crypt specimens.

51.10. Barium or oil containing stool specimen for ova and parasite examination.

51.11. Sputum for AFB not submitted in a special specimen collection device (e.g., Falcon or Evergreen).

51.12. Gram stains on catheter tips are not performed.

51.13. ***Note*:** Sub-optimal specimens will be handled on a case-by-case basis. Any specimen considered to be sub-optimal will be brought to the attention of the Chief, Microbiology, Microbiology Technical Supervisor or shift-leader for coordination with Microbiology Technicians. Supervisors or designee will notify requesting physician and discuss the appropriateness of testing for that specimen. If test result is still desired by the ordering physician, then the condition of the sample must be stated on the report, and a notation made of any limitation in test result interpretation.

52. Antimicrobial Susceptibility Testing:

52.1. Minimal Inhibitory Concentration (MIC) levels are performed routinely on suspect bacterial pathogens isolated from most clinical specimens.

52.2. E-tests susceptibility tests are routinely performed on all isolates of S. pneumoniae, H. influenza, and other Haemophilus species when isolated from sterile sites.

52.3. Susceptibility interpretations are made in accordance with the National Committee for Clinical Laboratory Standards (NCCLS) and the World Health Organization (WHO) Committee for Antimicrobial Testing recommendations. It is recommended that "susceptibility" be defined as one-fourth to one-half the average peak blood level.

★ **53. Microbiology Critical & Reportable Values:**

53.1. The following will be reported by telephone as critical value results:

Table 53.1. Microbiology Critical & Reportable Values.

RESULT
Positive growth obtained in Blood Culture bottles after normal duty hours or results from **Gram stain** or culture from blood, cerebral spinal fluid (CSF) or body cavity fluid.
Positive **stool cultures** for *Salmonella, Shigella*, *Campylobacter, E coli 0157:H7.*
Presence of **malarial** parasites.
Positive cryptococcal antigen - latex cryptococcal antigen agglutination test (**LCAT**).
Positive **rapid antigen detection** by agglutination for group B streptococci, *Haemophilus influenzae*, *Neisseria meningitides,* or *Streptococcus pneumoniae.*
Positive **fungal culture** for any systemic mold – *Blastomyces, Coccidoides, Cryptococcus, Histoplasma* or *Paracoccidoides.*
Amoebic dysentery (*Entamoeba histolytica*).
Positive culture for ***Brucella, Bordetella, Corynebacterium diptheriae, Vibrio cholera, Bacillus anthracis*** or ***Yersinia pestis.***
FOR INPATIENTS ONLY: Methicillin (oxacillin) resistant *Staphylococcus aureus* (**MRSA**).
Penicillin resistant *Streptococcus pneumoniae.*
Vancomycin resistant enterococci or staphlococci.
Antibiotic resistance to therapy indicated on the laboratory request comments.
*Positive **hemodialysis water cultures** >200 CFU/mL.

53.2. Values will be reported to Infection Control and/or ordering provider for tracking and follow-up of results. **Only authorized providers and nurses will be notified of these values.**

53.3. *Hemodialysis water cultures wil1 be called to the Dialysis Clinic.

Table 53.2. Microbiology Testing Availability/Comments.

★MICROBIOLOGY		
TEST	**SPECIMEN COLLECTION**	**COMMENTS**
Anaerobic culture **Syringe** **Anaerobic Swab** **Tissue**	Obtain deep aspirate, expel **ALL** air bubbles and cap needle. Submit to lab immediately. Place swab or aspiration into the inner tube of the container. Press down on the flat disc portion of the plunger until it contacts the rubber stopper. Submit to lab immediately. Collect the specimen close to the base of the wound rather than superficially. Abscess material should include pus along with a portion of the abscess wall. Submit to lab immediately.	Deep aspirates have a 30% better recovery rate for anaerobes than do swabs. The use of blood culture bottles for culture of anaerobic fluids other than blood is discouraged. Submit one half to surgical pathology in the appropriate fixative and the other half in a wide-mouthed screw-capped sterile collection container. **DO NOT** add fixative to the tissue specimens for culture.
Blood Cultures:	**PROCEDURE**: Cleanse the venipuncture site with an alcohol pad. Apply 2% iodine, or an iodophor solution in concentric fashion from a central point to the periphery of the site. Leave iodine on the skin for at least 1-minute. **DO NOT** touch the cleansed venipuncture site. Remove residual iodine from arm, after venipuncture, with an alcohol pad. Bottles must be properly filled and labeled. **BOTTLES:** Check expiration date, remove the sterile protective cap, and cleanse the vial top with 70% alcohol. Using the original syringe and needle (**DO NOT** change the syringe needle), dispense required volume into each bottle. Label the sides of the vials with the current date, date of birth, time, your initials, the patient's full name and SSAN or register number. If using labels, do not place over bar code area.	Gram stains will not be performed on bottles unless they flag as positive. They are continuously monitored for a five day period. If initiating immediate antibiotic therapy, submit 10 cc of blood from each of two separate venipuncture sites in standard aerobic/anaerobic bottles. If antibiotics already started-innoculate charcoal pediatric (yellow) bottles. **VOLUMES :** 8-10 cc of blood in an aerobic bottle (blue label) 8-10 cc of blood in an anaerobic bottle (purple label) (Indicated for patients with sepsis, intra-abdominal abscess or necrotizing colitis.) 1-4 cc (yellow label) for small volume collections (Pediatric and difficult to collect patients).

★MICROBIOLOGY		
TEST	**SPECIMEN COLLECTION**	**COMMENTS**
Body Fluids (other than Blood, Urine and CSF) **Bone Marrow**	Collect specimens using strict sterile technique. Inoculate marrow directly into blood culture vials or submit in green top heparinized tubes if direct specimen plating is required. Submit peripheral blood culture, also.	Transport immediately to the laboratory. Specimens may require an anticoagulant to prevent clotting (contact Microbiology for collection tube type).
C. Difficile Toxin A/B	Freshly passed feces is the specimen of choice. Submit in cardboard container and transport immediately.	DO NOT send multiple specimens, one sample is sufficient for diagnosis.
Catheter Tip	Cleanse catheter insertion site with alcohol and allow site to dry. Withdraw catheter aseptically. DO NOT allow catheter to touch surrounding skin. Use sterile scissors to cut tip.	Submit catheter tip (i.e., the length below the skin-catheter interface) in a sterile container. Only cultures with greater than 15 Colony Forming Unit (CFU) are worked up. Gram stains WILL NOT be done on catheter tips.
Chlamydia/GC Nucleic Acid Analysis: Genitourinary Tract sites	Consult BD ProbeTec ET collection kit (including swab and diluent) for collection technique. ***Note:*** Only genital sites and urine samples are acceptable for in-house testing. For information on testing other sites such as conjunctival swabs, contact Shipping department.	Transport to Microbiology section ASAP.
CLO-test ® (obtained from Microbiology Section)	A 2-3mm (diameter) biopsy specimen should be collected by endoscopy in the Gastroenterology department. Peel back the label of the CLOtest® so as to expose the gel. With a sterile 19 gauge needle, remove the specimen from the biopsy foreceps and push the specimen into the CLOtest® gel. Make certain that the tissue is completely immersed so that it will have maximum contact with the urea and the bacteriostat in the gel. Re-seal the CLOtest® and label with the patient's name, the date and time specimen was taken, and order test.	Transport to Microbiology immediately.
CSF Culture	Perform aseptic lumbar puncture. Place at least 1cc in CSF collection tubes.	★Submit first tube for microbiologic studies (culture).
Ear Culture	External - Using a swab, collect material from the active lesion margin. Avoid skin contamination. Internal - Collect by needle aspiration through the eardrum (tympanocentesis).	Diagnosis of otitis media is usually attempted only in cases of therapeutic failure or in neonates.

★MICROBIOLOGY		
TEST	**SPECIMEN COLLECTION**	**COMMENTS**
Fungal	Collect material from the active border of a lesion, or scrape away the surface. Obtain clippings from infected nails. In skin lesions, vesicles may be present, cut these off with sterile scissors; they may contain active growing fungal elements.	Transport to Microbiology section.
★Group B Streptococcus	Swab the lower vagina, followed by the rectum using the same swab or two different swabs. Cervical cultures are not recommended and a speculum should not be used for culture collection. Place the swab(s) into a nonnutritive transport medium.	***Note:*** If susceptibility testing is ordered for penicillin-allergic women, specimen labels should also identify the patient as penicillin allergic and should specify that susceptibility testing for clindamycin and erythromycin should be performed if GBS is isolated.
Gonoccoccal (GC) Culture **Rectal Specimen**	Anorectal specimens are obtained form the crypts just inside the anal ring.	Obtain Thayer Martin plates from Microbiology. Allow plates to warm up to room temperature before use. INNOCULATION: Apply collected material to Thayer Martin plates. Transport to the laboratory immediately.
Pharyngeal Specimen	Pharyngeal specimens are obtained from the tonsillar region and posterior pharynx.	
Cervical Specimen	Wipe cervix clean of vaginal secretions and mucus. A cervical (not vaginal) culture is collected under direct visualization.	If pelvic examination suggests vaginal glands or the urethra are involved, swab these areas for cultures. Urethral swabs are collected prior to or 1-hour after urination. Transport to the laboratory immediately.
Urethral Specimen	Collect the discharge or sample the urethral canal (2-3 cm) using a calcium alginate swab with a flexible wire.	
Occult Blood	If only fecal occult blood is requested, inoculate guiac cards according to provided directions.	Do not use stool from toilet bowl.

★MICROBIOLOGY		
TEST	**SPECIMEN COLLECTION**	**COMMENTS**
Ova & Parasites	Collect 3 stool specimens over a 1 week period. All O&P exams include screening for *Cryptosporidium* and *Giardia* **QUANTITY:** Analysis requires a "walnut" sized specimen or equivalent liquid specimen. If delay in transport is unavoidable, place the specimen directly into 10% Formalin & PVA fixatives. Liquid samples should be delivered to the laboratory immediately.	**UNACCEPTABLE SPECIMENS:** Mineral/castor oil, Metamucil (within 3 days); Barium for gastrointestinal series (within 3 weeks); Gallbladder dye (within 3 weeks); Any iodine preparations or anti amoebic treatment (within 3 weeks) Swabs; Timed specimens (i.e., 24 or 72 hr for fecal fat); Diapers
Pinworm Prep	Collect early in the morning before the patient wipes or scratches the anal area & disseminates the eggs. Spread the buttocks to expose the anus. Press the sticky side of the pinworm paddle against the anal meatus. Try not to include fecal material. Place paddle back into transport device to prevent exposure to eggs.	Stool material is unacceptable for pinworm detection. The commercial plastic pinworm "paddles" are the only acceptable specimen. Paddles may be obtained in the Pediatric Clinic.
Respiratory—Sputum (non TB)	The patient expectorates into a sterile collection container such as a Falcon container or one used for sterile urine collections.	Sputum samples are collected in the early morning. A single lower respiratory specimen is usually sufficient.
Respiratory—Sputum (TB)	Specimens are submitted in special sputum collection devices (e.g., Falcon or Evergreen).	Please submit three separate first morning samples. Deliver to the lab ASAP. Testing Performed at Public Health Lab.
Respiratory—Throat	Depress the tongue with a tongue blade to minimize contamination. Obtain culture under direct visualization with a culturette swab by vigorously swabbing both tonsilar areas, the posterior pharynx, and any areas of inflammation, ulceration, exudation or capsule formation.	Call Microbiology when organisms other than Streptococcus Group A are suspected. Throat cultures are contraindicated for patients with inflamed epiglottitis.
Skin--KOH Prep	Cleanse affected area with 70% alcohol. Gently scrape surface of active margin of lesion (do not draw blood). Place sample in clean container.	Try to provide enough scrapings to cover an area the size of the head of a thumbtack. If specimens are submitted on glass slides, tape slides together and submit in envelope or petri dish.
Stool—Culture, Fecal leukocytes	Collect stool in a clean dry stool container. It is recommended that samples are collected daily for three consecutive days to help in the recovery of any pathogen. Pass the swab beyond the anal sphincter, carefully rotate	Deliver the specimen to the laboratory immediately. DO NOT refrigerate. Stools are routinely examined for: Salmonella, Shigella,

Stool—Rectal Swab	and withdraw. Place the swab back into its holder and crush the preservative ampule.	Campylobacter and E. coli 0157H7. Vibrio, Yersinia, Staphylococcal enterocolitis or C. difficile toxin are ordered separately. Diapers are unacceptable. A rectal swab IS NOT a suitable specimen for C. difficile toxin.
Throat		see respiratory-throat
TB		see respiratory-sputum (TB)

★MICROBIOLOGY		
TEST	**SPECIMEN COLLECTION**	**COMMENTS**
Urine **Clean-catch Midstream (Male)** **Clean-catch Midstream (Female)** **Catheter (indwelling)** **Urine Suprapubic**	Cleanse glans with provided antiseptic pad. Retract foreskin, if necessary, and begin voiding. Collect urine in provided container when bladder "feels" half empty. Cleanse urethral area with provided antiseptic pad, wiping towards the anus. While holding labia apart, begin voiding and collect urine in provided container when bladder "feels" half empty. Aspirate urine sample with a syringe after disinfecting the sampling port with alcohol. Place in sterile urine container and transport to lab. Prep site with alcohol followed by iodophor. Wait one minute before performing procedure. Aspirate bladder urine and transport sample immediately to the lab.	DO NOT stop flow of urine during collection. Room temperature urine must be processed within 2 hours of collection. Refrigeration for 2-4 hours is acceptable but transport samples at earliest opportunity so that cultures are not delayed. Urinary catheter tips and timed 24-hour urines are unacceptable for culture. The connection between the catheter and the drainage tube should not be broken for specimen collection. Specimen SHOULD NOT be taken from the drainage bag.
Wet Prep Trophozoites or Yeast	Collect specimen with a sterile cotton swab and small amount of physiological saline. Place swab and saline in a small test tube.	Deliver to the laboratory immediately.
Wound Abscess--Open	Remove surface exudate by wiping with 70% alcohol or sterile saline. Aspirate, if possible or pass swab deep into lesion and firmly sample lesions advancing edge	Tissue or fluid is always superior to a swab.
Wound Abscess--Closed	Clean area with 70% alcohol or sterile saline. Aspirate abscess wall material with syringe. Remove needle, cap syringe, and transport immediately.	Should also be submitted for anaerobic culture.

MICROBIOLOGY ANTIGEN TESTING		
TEST	**SPECIMEN COLLECTION**	**COMMENTS**
Adenovirus Antigen	Nasopharyngeal swabs, eye swabs, stool.	Sterile swabs should be used for collection and placed in a sterile container. **Do not** place swabs in transport media.
Bacterial Antigen Panel **H. influenza Type B** **Gr B Streptococcus** **Strep pneumoniae** **Neisseria meningitidis**	CSF, Serum, Urine	CSF available **STAT** 24 hours. Serum & Urine; routine only. Negative CSF is followed up with culture.
Cryptococcal Antigen	Serum, CSF	CSF samples performed STAT
Gr A Strep Antigen	Depress the tongue with a tongue blade to minimize contamination. Obtain culture under direct visualization with a culturette swab by vigorously swabbing both tonsilar areas, the posterior pharynx, and any area of inflammation, ulceration, exudation or capsule formation.	Collect 2 swabs; if antigen test is negative a routine throat culture should be performed.
Influenzae A/B Antigen	Nasal wash, aspirate Nasopharyngeal swab	Collect nasal washing in sterile urine container. NP swabs maybe sent in a red top tube with **NO MORE THAN 1 ml** of sterile saline.
Respiratory Syncytial Virus (RSV) Antigen	Nasal wash, aspirate Nasopharyngeal swab	Collect nasal washing in sterile urine container. NP swabs maybe sent in a red top tube with **NO MORE THAN 1 ml** of sterile saline.
Rotavirus Antigen	Freshly passed feces is the specimen of choice. Submit in cardboard container and transport immediately.	The use of meconium stools in this assay is not recommended.
Strep pneumoniae Antigen	Urine (for the diagnosis of pneumonia) CSF (for the diagnosis of meningitis).	URINE: Collect urine specimens in standard containers. Store at room temperature (15-30 ^{o} C). CSF: Collect CSF according to standard procedures and store at room temperature (15-30 ^{o} C) for up to 24 hours before testing. Alternatively, properly collected CSF may be refrigerated (2-8 ^{o} C) or frozen (-20 ^{o} C) for up to 1-week before testing.

MICROBIOLOGY REFERRAL CULTURES		
Bordetella pertussis	Obtain nasopharyngeal sample using NP swab. Pass gently through the nose into the nasopharynx, rotate, remove and place into Regan Lowe Transport media.	**Contact Shipping** department to obtain Regan Lowe Transport media and for any additional inquiries.
Corynebacterium diphtheria	Collect pharyngeal specimens and place in Amies or Stuarts transport media.	**Contact Shipping** department for any additional inquiries.
Viral Cultures including Herpes simplex	Collect specimens (swabs of vesicles, eye exudates, etc) and place in viral transport media.	**Contact Shipping** department to obtain viral transport media and for any additional inquiries.

Section G—Surgical Pathology

54. Surgical Pathology:

54.1. The Histopathology section (376-4449), processes and prepares tissues for interpretation by pathologists. After normal duty hours contact the hospital information desk (376-2550), for the on call Histology technician and Pathologist pager numbers.

55. Guidelines for Paperwork and Labeling Specimens:

55.1. Tissue exam requests must be ordered in CHCS/AHLTA. Outside contributing facilities must also submit a list of pathologic material. The following specimen information must be included:

55.1.1. Patient's full name

55.1.2. Birth Date

55.1.3. Register Number

55.1.4. Sex

55.1.5. FMP-SSAN (For dependents, give military sponsor's SSAN and dependent's family member prefix.)

55.1.6. Submitting facility and clinic/MEPRS Code

55.1.7. Doctor's name (provider's stamp and signature)

55.1.8. Specimen type and anatomic source of specimen

55.1.9. Date the specimen was obtained

55.1.10. Clinical information including history, physical exam and pre/post-operative diagnoses.

55.1.10.1. When several specimens are removed from a patient during one operation, note on the Exam Request the site and type of each specimen, designate these as A, B, C, etc.

55.2. All specimen container labels must be attached to the container and not the lid, and must include:

55.2.1. Patient's name

55.2.2. Register number

55.2.3. SSAN

55.2.4. Date specimen was obtained

55.2.5. Doctor's name

55.2.6. Type and location of specimen (give anatomic site, not the preoperative clinical diagnosis)

55.2.7. Name of submitting facility.

56. Specimen Delivery Locations:

56.1. Duty Hours: Clinics, deliver specimens to the Histopathology gross room, 1B-403.

56.2. Evenings, Weekends, and Holidays: Hold and submit to the gross room on the next workday, or deliver to the main laboratory reception desk.

57. Specimens Sent From Outside Facilities:

57.1. Proper CHCS/AHLTA orders and paperwork (see above) must accompany the specimens.

57.2. Make sure the shipped specimens comply with the following requirements:

57.2.1. The contributors list is accurately completed.

57.2.2. Specimens are in the proper fixative (avoid sending excessive amounts of fixative. Once a specimen is fixed, excess fixative can be poured off).

57.2.3. All specimen container lids are secured with tape.

57.2.4. All paperwork and specimens are in separate ziplocked plastic bags.

57.2.5. The shipping carton is of proper strength (crush resistant).

57.2.6. There is sufficient packaging material on all sides inside the carton.

57.2.7. The carton is properly addressed.

58. Specimen Rejection Criteria:

58.1. Specimens may not be processed if they are improperly labeled, or the request or paperwork are incomplete. Operating room/clinic personnel will be required to make the necessary corrections before specimens will be processed.

Table 58.1. Surgical Pathology Testing Availability/Comments.

SURGICAL PATHOLOGY		
TEST	**SPECIMEN**	**COMMENTS**
Bone Lesions	Bone specimen	Submit radiographs with the specimen.
Breast Biopsy	Fresh specimen	Deliver immediately to Histology. Submit radiographs with needle directed biopsies. After normal duty hours submit in formalin or notify pathologist on call for evaluation of fresh specimens.
Cervical Cone Biopsy	Tissue for routine examination	Open the specimen at the 12 o'clock position, and pin it to a tongue blade with the endocervical canal facing away from the blade. (Hypodermic needles may be used to pin the specimen.) Place the pinned specimen in a container of 10% formalin.
Consult materials to be sent to another facility	Slides, paraffin blocks.	Physicians must have patient's written consent for the release of Medical Information from Health Records.
Cultures-Tissue	Fresh specimen.	Physician must submit to microbiology, a separate portion of the specimen in a sterile container, along with a computer order entry. **DO NOT** Add Formalin.
Frozen Sections	Fresh tissue—Request frozen sections only when results will directly affect or alter the character or extent of surgery.	**DO NOT** place in fixative or saline. Deliver immediately to Histology. A histotech must be notified that you are delivering a Frozen Section. If a frozen section is anticipated, notify histology before beginning surgery. After normal duty hours, notify histology tech and/or pathologist on call.

SURGICAL PATHOLOGY		
TEST	**SPECIMEN**	**COMMENTS**
Lymph Nodes, evaluation for Lymphoma	Fresh tissue.	Before lymph node biopsy procedure, discuss the case with the pathologist who will receive the specimen. Deliver immediately. A histotech must be notified that you are delivering a lymph node.
Muscle Biopsy	Fresh muscle (usually deltoid or quadriceps) Notify Pathology two (2) days prior to the biopsy.	Submit muscle at least 1 x 3 cm, with a muscle clamp in place. Keep moist in saline dampened gauze. **DO NOT SOAK THE TISSUE IN SALINE**. Deliver immediately to Histology. A histotech must be notified that you are delivering a muscle biopsy.
Nerve Biopsy	Fresh nerve tissue (usually a sural nerve biopsy). Notify Pathology two (2) days prior to the biopsy.	If possible submit at least two muscle specimens fresh 1.5 x 3 cm in length clamped in place with a muscle clamp. Keep moist in saline dampened gauze. **DO NOT SOAK THE TISSUE IN SALINE**. Deliver immediately to Histology. A histotech must be notified that you are delivering a muscle biopsy.
Kidney Biopsy	Notify pathologist two days prior to procedure	Submit one portion of tissue in formalin for light microscopy, one portion of tissue in gluteraldehyde for election microscopy and one portion of tissue in Zuess fixative for immunfluorescence.
Tissue Exam	Tissue for routine examination	Place tissue in 10 volumes of 10% formalin for each volume of tissue, submit to histology.

Section H—Autopsy Pathology

59. Permission:

59.1. The attending physician must obtain legal permission from the next of kin, using SF Form 523, *Clinical Record-Authorization for Autopsy (DD Form 2005, Privacy Act Statement-Health Care Records serves)*, and is expected to discuss the case with the pathologist prior to the autopsy. A Keesler AFB Form 130, *Request for Autopsy* must also be prepared. The admissions and Dispositions Office (376-3049) will assist you in this process. The value of the autopsy is enhanced if the requester records on the forms the clinical questions that the autopsy should address.

59.2. MDGI 44-121, *Medical-Legal Aspects of Postmortem (Autopsy), Transportation of Bodies, and Disposition of Remains* and MDGI 44-153, *Disposition of Remains* discuss general administrative aspects of autopsies. AFJI 44-111, *Armed Forces Medical Examiner System* discusses the *Armed Forces Medical Examiner System*.

60. Scheduling:

60.1. Admissions and Dispositions will deliver the completed SF Form 523, the Keesler AFB Form 130 and the medical records to Pathology. After review by the responsible pathologist, a start time for the autopsy will be determined. Medical staff may attend the autopsy and/or arrange a case review summary of gross finding with the prosecting pathologist.

★ **61. Turnaround Time:**

61.1. Autopsies are performed seven days a week. Autopsy requests received after 1200 hours are normally performed the next morning. A preliminary report of gross anatomical findings is prepared within two working days. Routine autopsies are completed within 30 working days. Complex cases require up to three months to complete.

Section I—Tumor Registry:

62. Tumor Registry

62.1. The tumor registry maintains records of patients who have cancer. Data is available to providers for follow-up of patients and research. Requests for information must be coordinated through the tumor registrar (376-4455).

Section J—Cytology

★ **63. Cytology Samples:**

63.1. The Flight maintains a limited service Cytology section. In addition to processing and interpretation of routine Non-Gynecological specimens, a cytotechnologist is available to assist with the collection of fine needle aspiration and bronchoscopy specimens.

63.2. A pathologist is available to assess the adequacy of radiologically guided fine needle aspirations. A pathologist is also available to perform fine needle aspirations of superficial masses.

63.3. These services are provided from 0730 to 1600 on normal duty days and should be scheduled in advance by calling the cytology department (376-4454) to ensure availability of staff and to prevent conflicts with other procedures.

64. Guidelines For Ordering Tests And Labeling Specimens:

64.1. Cytology test requests must be ordered in Keesler AFB's CHCS/AHLTA. Specimens must be accompanied by a contributor's list that includes each patient's name, SSAN and FMP, and name of the submitting facility. Gyn and Non-Gyn specimens must be listed on separate contributor's lists. If the submitting clinician or designee isn't able to access Keesler AFB's CHCS/AHLTA, a SF Form 541, Medical Records, Gynecologic Cytology (or comparable substitute) may be used as an interim measure until CHCS/AHLTA access is established.

64.1.1. Cytology orders must include the following information (failure to include this information may result in the specimen receiving an "Unsatisfactory for evaluation," or "Limited by" diagnosis):

64.1.1.1. For GYN Cytology:
64.1.1.1.1. Patient's full name

64.1.1.1.2. Birth Date

64.1.1.1.3. FMP-SSAN (For dependents, give military sponsor's SSAN and dependent's family member prefix.)

64.1.1.1.4. Submitting facility and clinic

64.1.1.1.5. Provider's Name and telephone number

64.1.1.1.6. Specimen type (anatomic source of specimen)

64.1.1.1.7. Date specimen was obtained

64.1.1.1.8. Last Menstrual Period

64.1.1.1.9. Information on use of Birth Control Pills, Hormone Therapy, or Intrauterine Device (IUD)

64.1.1.1.10. Comment if Post-Menopausal, Pregnant, Post Partum, or Hysterectomy

64.1.1.1.11. Information on Radiation or Cytotoxic Therapy, if applicable

64.1.1.1.12. Date/results of previous cytology diagnoses

64.1.1.1.13. Cytology comments including clinical information and physical exam

64.1.2. For Non-GYN Cytology:

64.1.2.1. Patient's full name

64.1.2.2. Birth Date

64.1.2.3. Sex

64.1.2.4. FMP-SSAN (For dependents, give military sponsor's SSAN and dependent's family member prefix.)

64.1.2.5. Submitting facility and clinic

64.1.2.6. Provider's Name and telephone number

64.1.2.7. Specimen type (anatomic source of specimen)

64.1.2.8. Collection Technique (e.g., Fine Needle Aspiration, nipple discharge, voided urine, etc.)

64.1.2.9. Date specimen was obtained

64.1.2.10. Clinical information, including history, pre/post operative diagnoses, and physical exam findings

64.1.2.11. Dates of previous positive results

64.1.3. All specimen containers must be labeled with the patient name, SSAN, and specimen type.

64.1.4. The patient's last name, first name, and the last four numbers of the SSAN must be clearly written on the frosted end of each specimen slide. Use indelible pencil or ink (which will not run when exposed to the solvents used in cytologic processing and staining procedures).

64.1.5. If the specimen poses any special hazards to the laboratory staff (such as TB), clearly indicate this on the specimen container and in the orders.

64.1.6. Specimen containers and paperwork that are soiled by blood or other body fluids may be rejected.

65. Specimen Delivery Locations:

65.1. Normal Duty Hours: Submit all smears and fluids to the Pathology/Histology section.

65.2. Evenings, Weekends, and Holidays: Submit all specimens to the main laboratory reception desk.

66. Specimens Sent From Outside Facilities:

66.1. Shipping of Pap Smears: All Pap Smears have been consolidated at Wilford Hall Medical Center for processing and interpretation.

66.2. Shipping of Non-Gyn Specimens: A contributor's list which includes each patient's name, SSAN and FMP, and name of the submitting facility must accompany the specimen(s). Pack slides in sturdy boxes designed to ship glass slides. Please specify which slides are fixed or air-dried. Using a pencil, label the slide as fixed or air-dried on its frosted edge. Use gauze across the top of the slides. Use tape to secure gauze and lid of slide box. When properly packed, the box will not rattle when gently shaken. Pad the slide box and pack inside another larger, sturdy box. Don't ship in the same container with formalin-fixed specimens; the formailin vapors may interfere with our staining procedure. Liquid specimens must be fixed with a proper fixative (SacCommano Fluid). Call DSN 591-4454, with any questions.

67. Specimen Rejection Criteria:

67.1. Unlabeled specimens will not be accepted.

67.1.1. Incomplete Order Information: Specimens received without complete orders may be returned to the requesting clinic/ward.

67.1.2. No Contributor's List: Pap smears submitted without a contributor's list may be returned or held until a properly completed form is received.

67.2. At the reviewing pathologist's discretion, an unfixed non-Gyn specimen that was un-refrigerated for more than 8 hours may be rejected.

67.3. Specimens submitted without properly fitting lids or with surface contamination of containers may not be accepted.

67.4. Unauthorized requesting party. A cytology exam may only be requested by a physician, nurse clinician, or other authorized health care provider.

67.5. Broken Glass Slides: We may process a broken slide if it is the only broken slide in the container and it is broken in such a manner that reassembly will not degrade smear assessment, otherwise, broken slides will be rejected.

67.6. Syringes with needles. Specimen submitted in syringe with attached needle may not be accepted.

Table 67.1. Cytology Testing Availability/Comments.

CYTOLOGY			
TEST	**SPECIMEN**	**TECHNIQUE**	**COMMENTS**
Aspiration Biopsy (Fine Needle)	Collect with a 23-25 Gauge needle and a 20cc syringe. Fix one half of the slides immediately in 95% ethanol and air-dry the remaining half. Label slides as "ETOH" or "air dried." Sample mass 3-5 times in order to obtain adequate material.	Avoid local anesthetic. Trap mass between fingers. Draw 5 cc of air into syringe. Maintain negative pressure while needle is moved rapidly back and forth within mass. Aspirate a small drop of fluid in hub of needle. Release suction and withdraw needle. Expel contents onto glass slide. Make smears.	Call Cytology (376-4454) at least 15 minutes prior to the procedure to arrange for a technologist to assist. Remove as much fluid as possible from cystic lesions. Remember to culture suspected infectious lesions.
Body Cavity Fluids (Pleural, Peritoneal, Pericardial, etc.)	During duty hours, hand-carry specimen in a leak proof container to cytology. Refrigerate specimen if collected after duty hours.	Balanced salt solution is used to wash body cavities.	**DO NOT** add alcohol to fluid. Heparin, 1 cc of 1:1000 per 100 ml may be added to prevent clotting. Use Saccomanno's fixative to fix aliquot if 72 hours processing delay anticipated.
Breast Nipple Secretion	Immediately fix in 95% ethanol. Make as many smears as material allows up to about 8 slides.	Express by gently pressing the areolar area with thumb and forefinger. Apply to slide/smear, fix immediately.	**DO NOT** manipulate further if no secretion appears with gentle compression.

CYTOLOGY			
TEST	**SPECIMEN**	**TECHNIQUE**	**COMMENTS**
Bronchio-alveolar (BAL) specimen	During duty hours, send to cytology unfixed in a leak proof container.	Infuse and aspirate desired volume of saline and collect in a screw top container.	If infectious or "rush" interpretation required, alert the pathology staff. Indicate special stains requested. Outside of duty hours, divide specimen; fix half in Saccomanno's solution and refrigerate the second half. Deliver specimens for culture directly to microbiology.
Bronchial Brushing	Submit 95% ethanol fixed slides. Submit brush in Saccomanno's fixative.	Roll brush over slides with moderate pressure and immediately fix in 95% ethanol. Multiple slides should be made from each brush.	Call cytopathology (376-4454) 15 minutes prior to collection if cytotechnologist is needed. A post-bronchoscope sputum collected within 12 hrs following procedure may be of value.
Bronchial Washing	Collected in a "U" tube without fixative.	Infuse and aspirate desired volume of saline and collect in a screw top container.	Hand carry to cytology during normal duty hours. Refrigerate specimen collected during non-duty hours.

CYTOLOGY			
TEST	**SPECIMEN**	**TECHNIQUE**	**COMMENTS**
Cerebrospinal Fluid	Indicate location of collection (lumbar, ventricular, etc.) send unfixed immediately to cytology.	Allow blood to clear before collecting sample in screw cap test tube.	After duty hours, preserve specimen by adding an equal volume of 50% ethanol and refrigerating. Send separate specimens directly to hematology and microbiology.
Cervical-Vaginal Smear	Material from both the ectocervix and endocervical canal must be sampled. Specimens are collected using the ThinPrep® collection kits which include sampling devices. The spatula is used to collect the ectocervix sample and the brush is used for endocervical sampling. Each individual device should be immediately rinsed in the PreservCyt® solution vial by twirling device vigorously 10 times.	Secretions in the vaginal pool are collected with the round end of the plastic spatula. The notched end of the spatula is rotated around the circumference to sample the ectocervix. The endocervix is sampled with an endocervical brush rotated one-forth to one-half turn in the canal.	First and foremost is prevention of air-drying of the smears which can occur in a few seconds. **DO NOT** obtain specimen until 24 hours after douche, six weeks following cauterization, cryotherapy, curretage or biopsy. Endocervical brush is not for use with pregnant patients.
Endobronchial Biopsy (Pulmonary aspiration Biopsy)	Fix ½ of smears immediately in 95% ethanol and allow remaining ½ to air dry. Label accordingly.	Material is expressed from the needle onto a slide and smears made. Any tissue expressed should be submitted separately in formalin.	The needle can be rinsed with balance salt solution of Saccomanno fixative when procedure is completed.

CYTOLOGY			
TEST	**SPECIMEN**	**TECHNIQUE**	**COMMENTS**
Gastro-intestinal Tract (Esophageal, Gastric, and Bile duct Brushings)	Brush tip may be submitted in Saccomanno fixative. (Obtained from cytology or lab receiving). Fix slides in alcohol.	Quickly roll brush across slides. Speed is required to prevent air-drying. Immediately fix slides in 95% ethanol.	Call cytopathology (376-4454) at least 15 minutes prior to specimen collection for tech support.
Smears (e.g., Tzank preparation of eye or skin)	Immediately fix in 95% ethanol.	Scrape area to be sampled and smear on slide followed by immediate fixation. Prepare multiple slides.	Clearly indicate history and purpose of smear on requisition form.
Sputum	Three early morning specimens recommended. Collect directly into screw capped container with Saccomanno fixative, shake to mix, and send to cytology.	To reduce saliva and food contaminants rinse mouth prior to collection. Encourage patient to cough deeply.	Contact Respiratory Therapy if an induced sputum is required.

CYTOLOGY			
TEST	SPECIMEN	TECHNIQUE	COMMENTS
Touch Preparations	Alcohol and air-dried slides.	Press fresh cut surface against slide only once. Fix in 95% ethanol immediately. Air-dried slides may also be of benefit. Label accordingly.	Scraping may be required to obtain adequate cells on some specimens.
Urinary Tract (Random Urines, Catheterized, and Instrumen-tation Specimens).	Cell recovery is improved if patient is well hydrated. First morning specimens are not recommended for cytology. Fix urine in an equal volume of Saccomanno fixative.	Use saline or balanced salt solution, not sterile water, to wash bladder. For voided urines collect only the last two-thirds of the urine.	For cytomegalic inclusion disease fix urine immediately in an equal volume of Saccomanno fixative and hand-carry to cytology immediately. **Always** indicate whether urine is voided, catheterized, washed or post washing.

Section K—Genetics:

68. Genetics:

68.1. The Genetics laboratory is staffed Monday through Friday from 0730 to 1630 (CST); closed weekends and holidays. Call for information since most cytogenetics studies are done on a case-by-case basis. For genetic testing and/or shipping requirements/information contact:

68.2. Genetics Clinic: 228-376-3919; DSN 591-3904

68.3. Cytogenetics Laboratory: 228-376-3918; DSN 591-3918

68.4. Molecular DNA Laboratory: 228-376-3916; DSN 591-3916 or use the internet website to access the Medical Group Pamphlet (MDGP) 44-130, *Medical Genetics Laboratory Guide*: https://wwwmil.keesler.af.mil/medctr/mdos/Genetics/index.htm.

68.5. Mailing Address:

68.5.1. ATTN: Medical Genetics
81 MDG/SGOU
301 Fisher Street Room 1A-132
Keesler AFB, MS 39534-8519

Section L—Shipping (Specimens Referred In)

69. General.

69.1. All specimens referred in will be handled through our shipping department during the hours of 0700-1700 Monday through Friday. Please call DSN 591-4403 for further details or concerns.

69.2. All specimen transport containers must be labeled with appropriate bioharzard warnings to meet Department of Transportation, International Air Transport Association, and other applicable shipping requirements. All specimens received for testing must be properly labeled to include full name of patient, social security number, date collected. All specimens must be submitted in pour off tubes unless whole blood is required. In our guide, you will find proper specimen collection, shipment, and temperature requirements. If these guidelines are not followed, the specimens may be rejected and you will receive notification from one of the shipping technicians. All specimens sent to Keesler Medical Center Laboratory will be received with a transmittal list. Specimens and transmittal list should correspond. If there are any discrepancies, the submitting laboratory will be notified.

69.3. To generate a shipment, Mail in Registration (MIR) all specimens through Persona. When logging onto Persona, ensure you enter your base as the work element and not Keesler. If you enter Keesler, you will be logging in specimens directly into our system and you will have to re-accomplish your transmittal list. Also, when registering through MIR, ensure the lab referral location reflects your Base location, for example: Eglin is FEG. If not, you will not receive results back electronically. New accounts must contact the shipping section and have their encrypted Persona account established.

69.4. Once all specimens are entered into MIR, type in Generate Transmittal List (GTL). You may either generate by location or accession; it is your choice. You will next be asked to review specimen pool, you may do so if you would like. After you have sent the transmittal list via CHCS/AHLTA, please print a copy to our LABT6 printer and include a copy in your shipment as well. This aids in quicker processing of your shipment.

69.5. If you do not find the test needed, please call our shipping department at DSN 591-4403 and ask for a shipping technician or the NCOIC of shipping at DSN 591-4427. If we do not perform the test in house and are required to ship it out, we will not be a hub for referral shipments. Please send those specimens to the appropriate laboratory directly.

70. Adopted Forms:

AF Form 1225, *Informed Consent for Blood Transfusion*
Keesler AFB Form 405, *Requesting Physician Instructions for Autologous Donations*
Keesler AFB Form 405A, *Statement of Consent for Autologous Donation*
Keesler AFB Form 130, *Request for Autopsy*
SF Form 518, *Medical Record-Blood or Blood Component Transfusion (DD Form 2005, Privacy Act Statement-Health Care Records serves)*

SF Form 523, *Clinical Record-Authorization for Autopsy (DD Form 2005, Privacy Act Statement-Health Care Records serves)*
SF Form 541, *Medical Record, Gynecologic Cytology*

DAVID P. ARMSTRONG, Col, USAF, MC, CFS
Deputy Commander, 81st Medical Group

Attachments:
1. Glossary of References and Supporting Information
2. Index, Procedures Listed in Alphabetical Order
3. Keesler Lab Tests Specimen Requirements

★Attachment 1

GLOSSARY OF REFERENCE AND SUPPORTING INFORMATION

References

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AFMAN 37-123, *Management of Records*, 31 August 1994

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AFI 44-120, *Drug Abuse Testing Program*, 1 July 2000

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AFJI 44-111, *Armed Forces Medical Examiner System*, 2 January 1991

College of American Pathologists, Inspection and Accreditation Checklists, 2006

Department of Defense, Clinical Laboratory Improvement Program (DoD CLIP), 1 November 2002

Joint Commission on Accreditation of Healthcare Organizations' Comprehensive Accreditation Manual for Pathology and Clinical Laboratory Services, 2004

MDGI 44-121, *Medical-Legal Aspects of Postmortem (Autopsy), Transportation of Bodies, and Disposition of Remains*, 2 April 2004

MDGI 44-153, *Disposition of Remains*, 13 September 2004

MDGI 44-175, *Quality Management for Lab Testing in Ancillary (Point of Care) Locations*, 27 Jun 06

MDGI 44-178, *Withdrawal of Blood-Blood Alcohol Testing*, 18 June 2004

MDGI 44-180, *Pneumatic Tube System*, 12 October 2004

MDGP 44-130, *Medical Genetics Laboratory Guide*, 9 June 2004

SGSCAC OI 44-597, *Blood Alcohol Test (Ethanol)*, 7 February 2007

Abbreviations and Acronyms

AAA— Abdominal Aortic Aneurysm

AABB—American Association of Blood Banks

Ab—Antibody

A/B—Influenza typing (i.e. A or B)

ABO—Blood typing (i.e. A, B, AB, O)

ABO/Rh—Blood typing to include Rhesus (Rh) factor (i.e. +, -)

AFB—Air Force Base

AFI—Air Force Instruction

AFJI—Air Force Joint Instruction

AFP— Alphafetoprotein

AFPD—Air Force Policy Directive

AFMAN—Air Force Manual

AHF—Anti-hemolytic factor

Alb—Albumin

ALT— Alanine transaminase

AMI—Acute Myocardial Infarction

ANA—Antinuclear Antibodies

APT Test—Antibodies to prothrombin test

APTT—Activated Partial Thromboplastin Time

ASAP—As Soon As Possible

AST— Aspartate aminotransferase

ATTN—Attention

A1C—Hemoglobin A1C

BAL—Bronchio-alveolar

BAT—Biological Augmentation Team

BD—Becton Dickenson

BUN—Blood Urea Nitrogen

C—Celsius

Ca—Calcium

CAP—College of American Pathologists

CBC—Complete blood count

cc—cubic centimeters

CCU—Coronary Care Unit

CEA— Carcinoembryonic Antigen

CF—Cystic Fibrosis

CFU—Colony Forming Unit

CHCS/AHLTA—Composite Health Care System/The Electronic Charting System (DoD electronic health records system)

Chol—Cholesterol

Cl—Chloride

CK—Creatine kinase

CK-MB— Creatine Kinase–MB fraction

CLIA 88—Clinical Laboratory Improvement Act of 1988

CLO-test— Camplyobacter-like organism test

CL OI—Clinical Laboratory Operating Instruction

cm—centimeters

CMV—Cytomegalovirus

CO_2—Carbon dioxide

CPK— Creatine phosphokinase

CPR—Cardiopulmonary Resuscitation

Cr—Creatinine

CSF—Cerebral Spinal Fluid

CST—Central Standard Time

CTV—Cardiothoracic Vascular

CWS—Compressed Work Schedule

DAT—Direct Antigen Test

DBil—Direct Bilirubin

DBSS—Defense Blood Standard System

DDAVP—Desmopressin Acetate

DEERS—Defense Enrollment Eligibility Reporting System

DFA—Direct Fluorescent Antibody

DIC—Disseminated Intravascular Coagulation

DSN—Defense Switched Network

DoD—Department of Defense

DoD Clip—Department of Defense Clinical Laboratory Improvement Program

ED—Emergency Department

EDTA—Ethylenediaminetetra-Acetic Acid

EMEDS—Expeditionary Medical Support

ENT—Eye, Nose, and Throat

ESR—Erythrocyte Sedimentation Rate

ET—Becton Dickenson ProbeTec ET collection kit; proprietary collection method

ETOH—Ethanol hydroxyethane

FDP—Fibrin Degradation Products

FEG—Facility code for Eglin Air Force Base, FL

FEU— Functional Evaluation Unit

FFP—Fresh Frozen Plasma

fL—Femtoliters

FMP—Family Member Prefix

FSH—Follicle Stimulating Hormone

GBS—Group B Streptococcus

GC—Gonoccocal

g(m)—gram

GGT— Gamma-glutamyl transferase

GGTP— Gamma-glutamyl transpeptidase

g/dL—grams per deciliter

g/kg—grams per kilogram

Glu—Glucose

Gr—Group

Gr A—Group A Streptococcus

Gr B—Group B Streptococcus

GTL—Generate Transmittal List

GYN—Gynecology

G6PD—Glucose-6-Phos Deficiency

HCG— Human chorionic gonadotropin

HCL—Hydrochloric acid

HDL—High density lipoprotein

Hgb—Hemoglobin

HgbA_1C—Hemoglobin A1C

HPLC—High Performance Liquid Chromotography

hr(s)—hour(s)

HSV—Herpes

IAT—Antibody Detection Screen

IBC Unsat—Iron Binding Capacity, Unsaturated

IAW—In Accordance With

ICU—Intensive Care Unit

ID—Identification

IgA, IgG, IgM—Immunoglobulins

INR—International Normalized Ratio

Iron SAT—Iron Saturation

IU/24hr—International Units per 24hrs

IUD—Intrauterine Device

IU/L—International Units per liter

IV—Intravenous

IRR—Immediate Result Reporting

K—Potassium

KOH—Potassium Hydroxide

LABT6—lab printer

LAP—Leukocyte Alkaline Phosphatase

LCAT— latex cryptococcal antigen agglutination test

LD—lactate dehydrogenase

LDH— lactate dehydrogenase

LDL—Low Density Lipoprotein

LH—Luteinizing hormone

LIS—Laboratory Information System

LIT—Lactose Tolerance Test

LTT—Lactose Tolerance Test

MB—MB fraction of creatine kinase

MCH—Mean corpuscular hemoglobin

MCHC—Mean corpuscular hemoglobin concentration

MCV—Mean cell volume

MDGI—Medical Group Instruction

MDGP—Medical Group Pamphlet

MEPRS—Medical Expense And Performance Reporting System

mg—milligrams

mg/dL(mg/dl)— milligrams per deciliter

MIC—Minimal Inhibitory Concentration

min—minute

MIR—Mail in Registration

mIU/ml(L)—one millionth of an International Unit

ml/mL—milliliter

mm—millimeter

mm/hr—millimeter per hour

mmol/L—millimole per liter

mOsm/L—milliosmole per liter

MPV—Mean platelet volume

MRSA—Methacillian resistant Staphylococcus Aureus

MS—Mississippi

MSBOS—Maximum Surgical Blood Schedule

MTF—Military Treatment Facility

Na—Sodium

NCCLS—National Committee for Clinical Laboratory Standards

NCOIC—Noncommissioned Officer In Charge

Neg—Negative

ng—nanograms

ng/mL—nanograms per milliliter

NICU—Neonatal Intensive Care Unit

NLT—No Later Than

NP—Nasopharyngeal

OB—Obstetrics

OB/GYN—Obstetrics/Gynecology

OGTT(s)—Oral Glucose Tolerance Test(s)

OIC—Officer In Charge

O&P—Ova & Parasites

O.R.—Operating Room

PCP— phenylcyclohexylpiperidine

pH— measure of the acidity or basicity of a solution

pg/ml(L)—picograms per milliliter

Phos—Phosphorus

POC—Point of Care

Pos—Positive

PRBCs—Packed Red Blood Cells

PSA—Prostate Specific Antigen

PT—Protime

PTH—Parathyroid hormone

PVA—Polyvinyl alcohol

RBC(s)—Red Blood Cell(s)

RDS—Records Disposition Schedule

RDW—Red cell distribution width

RF—Rheumatoid Factor

Rh—Rhesus protein indication of ABO blood typing

RhIG—Rh Immune Globulin

RPR—Rapid Plasma Reagin

RSV—Respiratory Syncytial Virus

SF—Standard Form

SGAI—Clinical Research Laboratory

SGOL—Clinical Laboratory

SGOT— Serum glutamic oxaloacetic transaminase

SGPT— Serum glutamic pyruvic transaminase

SGSC CL OI—Laboratory Clinical Laboratory Operating Instruction

STAT(s)—Needed Urgently

SSAN—Social Security Number

SSN—Social Security Number

T&S—Type and Screen

TAGVHD—Transfusion Associated Graft-Versus-Host Disease

TB—Tuberculosis

Tbil(TBil)—Total bilirubin

TIBC—Total Iron Binding Capacity

TP—Total protein

Trig—Triglyceride

TSH—Thyroid Stimulating Hormone

TTP—Thrombotic Thrombocytopenic Purpura

Type B—B type of Haemophilus influenza

ug—micrograms

ug/dL—micrograms per deciliter

ug/Hgb—micrograms per hemoglobin

ug/mL—micrograms per milliliter

uIU—micro International Units

µL—micrograms per Liter

U/L—Units per Liter

umol/L—micromoles per Liter

USAF—United States Air Force

VMA— Vanillylmandelic acid

WHO—World Health Organization

yrs—years

5-HIA— 5-hydroxyindoleacetate

6N— 6 Normal

81 MDG/SGOU—81st Medical Group, Genetics

Attachment 2

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PROCEDURES LISTED IN ALPHABETICAL ORDER

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